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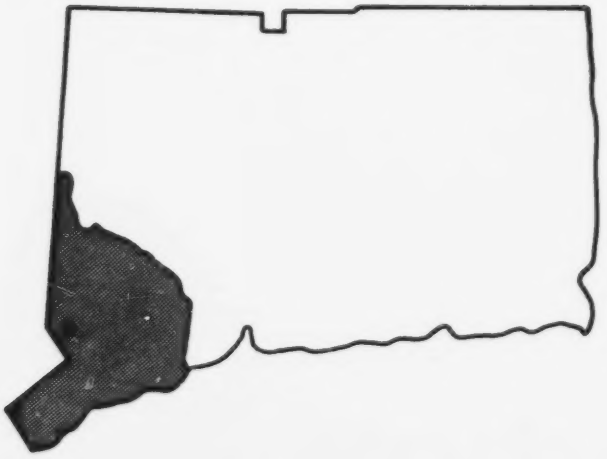
JUL 1982

FLOOD INSURANCE STUDY

COMPLETED
90 ORIGINAL

TOWN OF RIDGEFIELD, CONNECTICUT
FAIRFIELD COUNTY



MARCH 30, 1982

Federal Emergency Management Agency

COMMUNITY NUMBER - 090013

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Exhibit 2 - Flood Boundary and Floodway Map Index

Exhibit 3 - Flood Boundary and Floodway Map

PUBLISHED SEPARATELY:

Flood Insurance Rate Map Index

Flood Insurance Rate Map

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FLOOD INSURANCE STUDY
TOWN OF RIDGEFIELD, CONNECTICUT

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the Town of Ridgefield, Fairfield County, Connecticut, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study will be used to convert Ridgefield to the regular program of flood insurance by the Federal Emergency Management Agency (FEMA). Local and regional planners will use this study in their efforts to promote sound flood plain management.

In some states or communities, flood plain management criteria or regulations may exist that are more restrictive or comprehensive than those on which these federally-supported studies are based. These criteria take precedence over the minimum federal criteria for purposes of regulating development in the flood plain, as set forth in the Code of Federal Regulations at 44 CFR, 60.3. In such cases, however, it shall be understood that the state (or other jurisdictional agency) shall be able to explain these requirements and criteria.

1.2 Authority and Acknowledgements

The source of authority for this Flood Insurance Study is the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were prepared by Philip Genovese and Associates for the Federal Emergency Management Agency, under Contract No. H-4711. This work was completed in May 1980.

1.3 Coordination

In March 1978, an initial Consultation and Coordination Officer's (CCO) meeting was held with representatives of the FEMA, the Town of Ridgefield, including a selectman, the town planner, the Conservation Commission, and Philip Genovese and Associates (the study contractor). During the course of the study, the Soil Conservation Service (SCS) and the State of Connecticut were contacted for information concerning the SCS flood control plan for the Norwalk River watershed. On September 10, 1981, the results of the study were reviewed at a final CCO meeting attended by representatives of the FEMA, the town, and the study contractor.

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2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Town of Ridgefield, Fairfield County, Connecticut. The area of study is shown on the Vicinity Map (Figure 1).

The following streams were studied by detailed methods: the Norwalk River from the downstream corporate limits to the confluence of Ridgefield Brook; the Titicus River from the downstream corporate limits to a point approximately 1,000 feet above Rampoo Road; Ridgefield Brook from its confluence with the Norwalk River to the upstream end of Great Swamp; Cooper Pond Brook from its confluence with the Norwalk River to the intersection of Florida Hill Road and Ivy Hill Road; and the East Branch Silvermine River from the downstream corporate limits to Spectacle Lane. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction for the next five years, through May 1985.

The remaining portion of the East Branch Silvermine River, Mopus Brook, Kiahs Brook, East Spectacle Brook, Spectacle Brook, Silverspring Brook, several unnamed streams, Lake Noroneke, Fox Hill Lake, Lake Naraneka, Wataba Lake, Winwing Lake, Mamanasco Lake, Bennetts Ponds, Round Pond, Great Pond, and several unnamed swamps and ponds were studied by approximate methods. The portion of the East Branch Silvermine River that was studied by approximate methods was found to have negligible flood hazards, therefore, no flood boundaries were delineated for this area. Approximate methods of analysis were used to study those areas having low development potential and minimal flood hazards as identified at the initiation of the study. The scope and methods of study were proposed to and agreed upon by the FEMA.

2.2 Community Description

The Town of Ridgefield is located in the central portion of Fairfield County in southwestern Connecticut. It is bordered by the City of Danbury to the north and east, the Town of Redding to the east and southeast, the Town of Wilton to the south, and New York State to the west.

Ridgefield is a suburban community which had a population of 18,188 in 1970 and an estimated population of 20,200 in 1978 (References 1 and 2). The largest percentage of the population is located in the south-central portion of the town, although there is residential development scattered throughout the town. Most of the larger roads are located in central and southern Ridgefield. U. S. Route 7 runs along the eastern border, State

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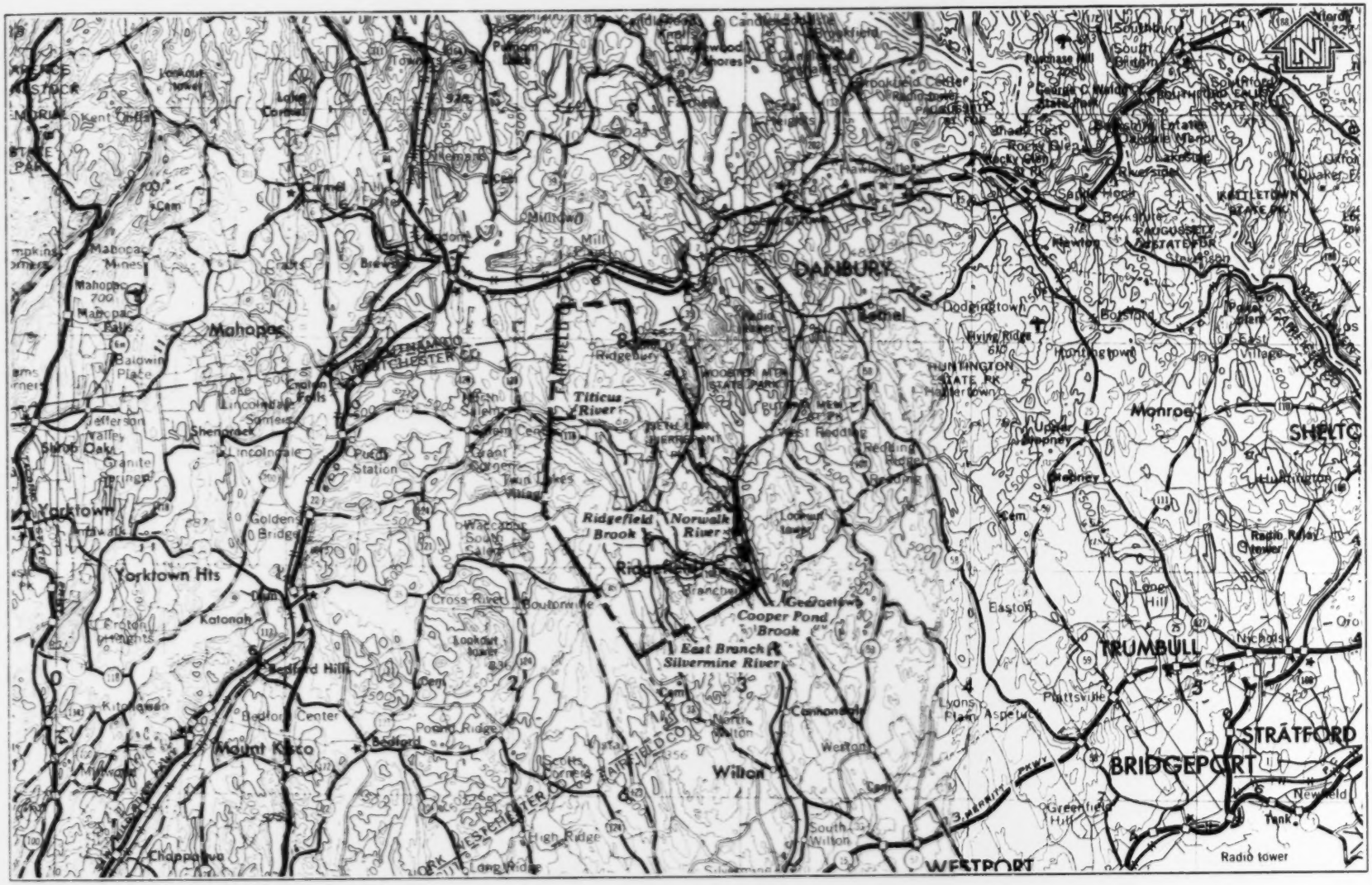

FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

APPROXIMATE SCALE

4 0 4 8 12 MILES

VICINITY MAP

Route 35 runs southwest to northeast, State Route 33 runs through the south-central portion of Ridgefield, and State Route 116 connects central Ridgefield to the northwestern part of the town.

The terrain of Ridgefield is hilly with a number of lakes and swamps. There are significant amounts of wide, flat flood plain along Ridgefield Brook, the Norwalk River, the Titicus River, and the East Branch Silvermine River. The Titicus River and Ridgefield Brook have their origins in central Ridgefield and flow north, while the Norwalk River and the East Branch Silvermine River flow south out of the eastern and southern portions of Ridgefield, respectively. Cooper Pond Brook flows east to its confluence with the Norwalk River in the southeastern portion of the town. There is a limited amount of commercial and industrial land bordering these streams.

The annual precipitation in Ridgefield averages 46 inches, with 22 inches of the total being in the form of runoff (Reference 3).

2.3 Principal Flood Problems

The history of flooding in Ridgefield indicates that there has been little basin-wide flooding, but a number of instances of localized flooding. Most floods were the result of large amounts of rainfall falling on frozen or saturated ground. Major floods occurred in September 1938, March 1953, August and October 1955, and January 1979. In 1965, the SCS estimated that the October 1955 flood (100-year recurrence interval on the Norwalk River) resulted in flood damage in excess of $390,000 (1965 dollars) in Ridgefield along the Norwalk River. In 1975, the damage was estimated at approximately three times the original figure (Reference 4). There are no estimates of flood damage along the other streams studied by detailed methods.

Figures 2, 3, 4, 5, 6, 7, and 8 show potential flood heights at several locations in the Town of Ridgefield.

2.4 Flood Protection Measures

The SCS has designed a system of flood control for the Norwalk River watershed which includes five dams and three lengths of channel improvement. Three of the dams and one length of channel improvement will be located in Ridgefield.

To date, only one of these dams has been built in Ridgefield, near Fox Hill Condominiums and the source of Ridgefield Brook. The other two dams, located just upstream of Millers Pond on the Norwalk River and near Candees Pond on Cooper Pond Brook, have not been constructed. The channel improvement at Branchville has not been built, as SCS policy prohibits the construction of channel improvements until all upstream dams have been built.

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Figure 2 - Potential 100- and 500-year flood heights on the Norwalk River looking downstream at the State Route 35 bridge.

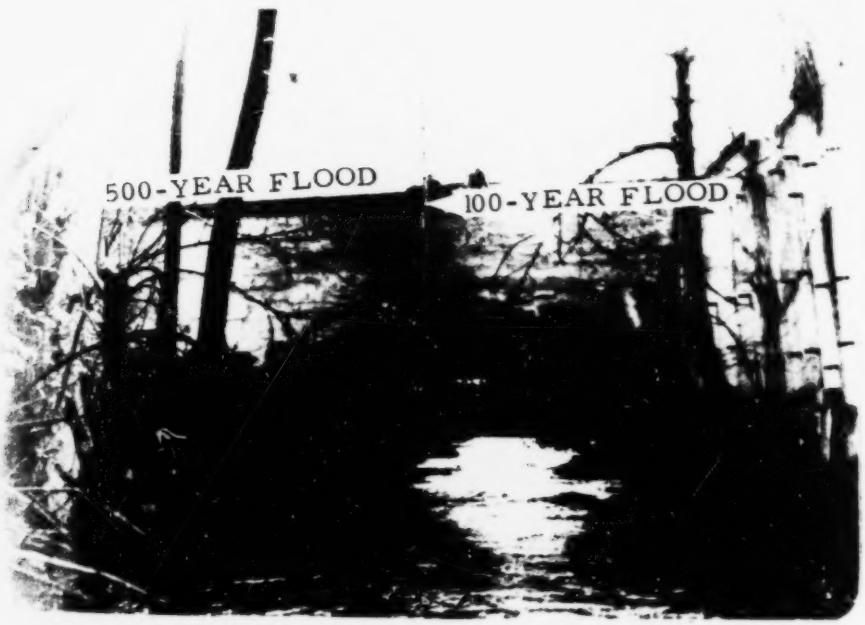

Figure 3 - Potential 100- and 500-year flood heights on the Norwalk River looking downstream at the Sanford Station Road bridge.

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Figure 4 - Potential 100- and 500-year flood heights on the Titicus River looking downstream at the Barlow Mountain Road bridge.

Figure 5 - Potential 100- and 500-year flood heights on Ridgefield Brook looking downstream at the State Route 35 bridge.

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Figure 6 - Potential 100- and 500-year flood heights on Cooper Pond Brook looking downstream at the State Route 102 bridge.

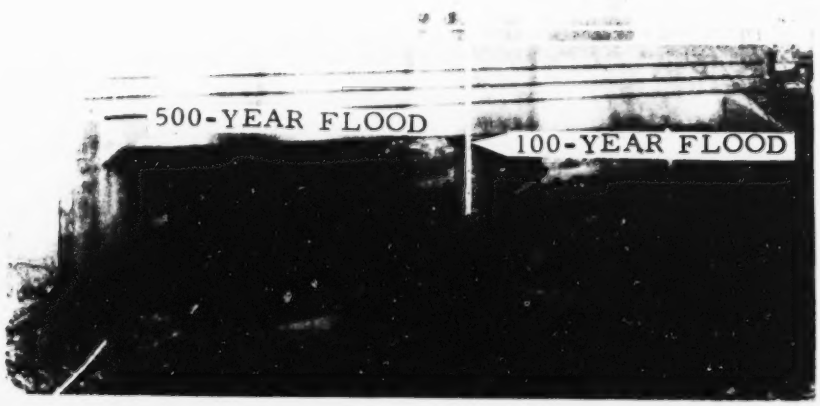

Figure 7 - Potential 100- and 500-year flood heights on Cooper Pond Brook looking downstream at the U. S. Route 7 bridge.

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Figure 8 - Potential 100- and 500-year flood heights on the East Branch Silvermine River looking upstream at the downstream crossing of the Wilton Road East bridge.

Recent conversations with the SCS indicated that there was no evidence to suggest any more construction will take place in the next five years (Reference 5). If this is the case, the 100-year flood flow of 3,300 cubic feet per second (cfs) at Branchville will only be decreased to 2,665 cfs instead of the expected 1,080 cfs. The October 1955 flood flow at Branchville was estimated at 3,040 cfs. There will be no decrease in the expected 1,090 cfs at the mouth of Cooper Pond Brook for a 100-year flood, but there will be a significant difference of 1,105 cfs to 235 cfs for Ridgefield Brook at the outlet from Great Swamp (Reference 6). There have been no significant structural changes on the Titicus River or the East Branch Silvermine River to alter flood flows.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data for this study. Flood events of a magnitude which are expected to be equalled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for flood plain management and for flood insurance premium rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a

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10-, 2-, 1-, and 0.2-percent chance, respectively, of being equalled or exceeded during any year. Although the recurrence interval represents the long-term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than one year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (one-percent chance of annual occurrence) in any 50-year period is about 40 percent (four in ten) and, for any 90-year period, the risk increases to about 60 percent (six in ten). The analyses reported here reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for floods of the selected recurrence intervals for each flooding source studied in detail affecting the community.

Peak discharges for the Titicus River and the East Branch Silvermine River were determined through the use of U. S. Geological Survey (USGS) formulas for ungaged streams in Connecticut (Reference 7). The formulas were the result of a log-Pearson Type III regression analysis performed on 107 stream gaging stations throughout Connecticut. The gaging stations have a mean length of record of 34 years and are supplemented by close to 200 years of historic information. From this information, the skew and standard deviation for each gaging station were calculated for use in the flood-flow equations and a summary map for Connecticut was developed. This information along with other watershed parameters (channel slope, drainage area, stream length, rainfall intensity, and degree of urbanization) were used to arrive at peak discharges for the Titicus and East Branch Silvermine Rivers. The parameters were taken from USGS topographic maps (Reference 8).

Peak discharges on the Norwalk River, Ridgefield Brook, and Cooper Pond Brook are a modification of flows calculated by the SCS (Reference 6). The modifications were needed because all the SCS proposed flood control structures will not be in place during the time period covered by this study. Therefore, peak discharges calculated by the SCS were modified to only include the effects of the SCS flood control dam on Ridgefield Brook.

The SCS method of calculating peak discharges used curves developed to predict runoff based primarily on soil type and land use. This method classifies areas according to these parameters and then applies a 24-hour duration storm to determine runoff units. The values were then adjusted based on watershed slope, channel slope, and percentages of swampy and impervious areas to arrive at a peak discharge for the watershed

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(Reference 9). The resulting discharges were modified by the SCS by routing the subject storms through the flood control structure using the Wilson Routing Method (Reference 10).

A summary of drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 1, "Summary of Discharges".

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
NORWALK RIVER					
Downstream of the confluence of Cooper Pond Brook	11.13	1,010	2,085	2,665	4,475
Upstream of the confluence of Cooper Pond Brook	8.73	665	1,250	1,595	2,680
At Millers Pond Dam	7.03	500	1,080	1,385	2,325
At the confluence of Ridgefield Brook	3.47	185	340	440	740
TITICUS RIVER					
At the downstream corporate limits	9.44	800	1,550	2,005	2,890
At Washington Highway	5.11	515	980	1,295	1,865
At North Street	3.05	320	620	825	1,190
At Wooster Street	1.91	215	435	585	845
At State Route 116	1.52	185	385	530	765
RIDGEFIELD BROOK					
At State Route 35	2.60	125	185	235	410
COOPER POND BROOK					
At the confluence with the Norwalk River	2.37	315	620	845	1,215
At Stony Hill Road	0.96	155	275	385	550
At Cooper Hill Road	0.72	145	215	315	455
EAST BRANCH SILVERMINE RIVER					
At State Route 33 in the Town of Wilton	2.06	235	460	605	875
Upstream of Gay Road	0.83	115	255	340	490

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3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of the flooding sources studied in detail were carried out to provide estimates of the elevations of floods of the selected recurrence intervals along each of these flooding sources.

Cross-section data were obtained from field survey, previous reports, and aerial photographs (Reference 6, 11, and 12). All bridges, dams, and culverts were field surveyed to obtain elevation data and structural geometry.

Except for portions of Ridgefield Brook, water-surface elevations of floods of the selected recurrence intervals were computed through the use of the COE HEC-2 step-backwater computer program (Reference 13). Water-surface elevations for Ridgefield Brook at Taylor Pond were computed through the use of a stage-discharge curve for Taylor Pond Dam (Reference 14). Water-surface elevations for Ridgefield Brook above the SCS flood control dam were computed using the Wilson Routing Method and information from the SCS (References 6 and 10). Starting water-surface elevations for the Norwalk River and the East Branch Silvermine River were obtained from the Flood Insurance Study for the Town of Wilton (Reference 15). Starting water-surface elevations for Ridgefield Brook were determined using the slope/area method. Starting water-surface elevations for the Titicus River and Cooper Pond Brook were determined using critical depth.

Roughness factors (Manning's "n") used in the hydraulic computations were assigned on the basis of field inspection. The channel "n" values for the Norwalk River ranged from 0.030 to 0.045, and the overbank "n" values ranged from 0.030 to 0.080. The channel "n" values for the Titicus River ranged from 0.035 to 0.045, and the overbank "n" values ranged from 0.050 to 0.075. The channel "n" values for Ridgefield Brook ranged from 0.012 to 0.035, and the overbank "n" values ranged from 0.025 to 0.070. For Cooper Pond Brook, the channel "n" values ranged from 0.035 to 0.040, and the overbank "n" values ranged from 0.025 to 0.075. For the East Branch Silvermine River, the channel "n" values ranged from 0.030 to 0.045, and the overbank "n" values ranged from 0.030 to 0.075.

Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals. Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway is computed (Section 4.2), selected cross-section locations are also shown on the Flood Boundary and Floodway Map (Exhibit 3).

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All elevations used in this study are referenced to the National Geodetic Vertical Datum of 1929 (NGVD), formerly referred to as Sea Level Datum of 1929. Locations of the elevation reference marks used in the study are shown on the maps.

The hydraulic analyses for this study are based on the effects of unobstructed flow. The flood elevations shown on the profiles are valid only if hydraulic structures remain unobstructed, and dams and other flood control structures operate properly and do not fail.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages state and local governments to adopt sound flood plain management programs. Therefore, each Flood Insurance Study includes a flood boundary map designed to assist communities in developing sound flood plain management measures.

4.1 Flood Boundaries

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the FEMA as the base flood for purposes of flood plain management measures. The 500-year flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the boundaries of the 100- and 500-year floods have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:4,800 with a contour interval of 5 feet (Reference 16). In cases where the 100- and 500-year flood boundaries are close together, only the 100-year boundary has been shown.

For the areas studied by approximate methods, the boundary of the 100-year flood was delineated using the Flood Hazard Boundary Map for Ridgefield and USGS topographic maps enlarged from a scale of 1:24,000 to a scale of 1:4,800 (References 8 and 17).

The boundaries of the 100- and 500-year floods are shown on the Flood Boundary and Floodway Map (Exhibit 3). Small areas within the flood boundaries may lie above the flood elevations and, therefore, may not be subject to flooding. Owing to limitations of the map scale and lack of detailed topographic data, such areas are not shown.

4.2 Floodways

Encroachment on flood plains, such as artificial fill, reduces the flood-carrying capacity, increases the flood heights of streams, and increases flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood

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hazard. For purposes of the Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent flood plain areas that must be kept free of encroachment in order that the 100-year flood can be carried without substantial increases in flood heights. Minimum standards of the FEMA limit such increases in flood heights to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this report are presented to local agencies as minimum standards that can be adopted or that can be used as a basis for additional studies.

The floodways presented in this study were computed on the basis of equal conveyance reduction from each side of the flood plains. The results of these computations are tabulated at selected cross sections for each stream segment for which a floodway is computed (Table 2).

As shown on the Flood Boundary and Floodway Map (Exhibit 3), the floodway widths were determined at cross sections; between cross sections, the boundaries were interpolated. In cases where the boundaries of the floodway and the 100-year flood are either close together or collinear, only the floodway boundary has been shown. Portions of the floodway widths of the Norwalk River extend beyond the corporate limits.

The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 9.

Near the mouths of streams studied in detail, floodway computations are made without regard to flood elevations on the receiving water body. Therefore, "With Floodway" elevations presented in Table 2 for certain downstream cross sections of Cooper Pond Brook are lower than the regulatory flood elevations in that area, which must take into account the 100-year flooding due to backwater from other sources.

A floodway was not shown for Ridgefield Brook through Taylor Pond and the Great Swamp since these are areas of storage for flood peaks; therefore, a floodway was deemed inappropriate in these areas.

5.0 INSURANCE APPLICATION

In order to establish actuarial insurance rates, the FEMA has developed a process to transform the data from the engineering study into flood insurance criteria. This process includes the determination of reaches, Flood Hazard

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Norwalk River								
A	70	101	558	4.8	344.3	344.3	344.6	0.3
B	2,315	212	1,446	1.1	352.1	352.1	352.6	0.5
C	4,325	43	189	8.5	360.2	360.2	360.2	0.0
D	8,025	75[2]	516	3.1	378.7	378.7	379.5	0.8
E	9,145	30	126	11.0	384.3	384.3	384.5	0.2
F	10,311	46	195	7.1	401.1	401.1	402.1	1.0
G	12,323	142	602	2.3	407.2	407.2	407.4	0.2
H	14,873	45	138	10.0	412.9	412.9	412.9	0.0
I	16,921	167	497	2.8	430.0	430.0	430.1	0.1
J	21,672	15	149	9.3	463.0	463.0	463.0	0.0
K	23,923	30	220	2.0	492.1	492.1	492.4	0.3
L	25,256	355	665	0.7	492.3	492.3	492.6	0.3
M	26,710	11	58	7.6	509.6	509.6	509.6	0.0
N	27,948	16	47	9.3	528.1	528.1	528.3	0.2
O	30,221	55	342	1.3	556.5	556.5	556.5	0.0

[1]Feet above corporate limits

[2]This width extends beyond corporate limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

FLOODWAY DATA

NORWALK RIVER

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Titicus River								
A	690	454	1,739	1.2	496.4	496.4	496.6	0.2
B	3,150	298	629	3.2	497.5	497.5	498.3	0.8
C	6,999	135	902	1.4	506.4	506.4	507.3	0.9
D	9,044	90	389	3.3	512.9	512.9	512.9	0.0
E	9,839	115	537	2.4	519.1	519.1	519.9	0.8
F	10,120	130	696	1.9	525.8	525.8	526.8	1.0
G	11,940	32	127	10.2	564.3	564.3	564.5	0.2
H	13,468	270	1,282	0.6	574.2	574.2	574.3	0.1
I	16,568	274	440	1.9	574.5	574.5	574.7	0.2
J	19,828	52	151	0.1	578.5	578.5	579.2	0.7
K	24,418	12	79	6.7	594.2	594.2	594.3	0.1
L	25,328	50	98	5.4	622.3	622.3	622.7	0.4
M	26,961	86	246	2.2	674.1	674.1	674.9	0.8
N	27,407	149	653	0.8	680.4	680.4	680.9	0.5
O	27,927	40	90	5.9	684.5	684.5	684.5	0.0

[1]Feet from corporate limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

FLOODWAY DATA

TITICUS RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Ridgefield Brook								
A	1,581	32	61	3.9	569.7	569.7	569.8	0.1
B	1,787	88	261	0.9	570.8	570.8	571.5	0.7
C	3,187	222	627	0.4	571.0	571.0	571.6	0.6
D	5,387	23	51	4.6	571.0	571.0	571.7	0.7
E	7,107	42	124	1.9	572.9	572.9	573.5	0.6
F	9,107	95	268	0.9	573.2	573.2	573.8	0.6
G	9,374	20	52	4.5	573.8	573.8	574.0	0.2
Cooper Pond Brook								
A	214	32	145	5.8	350.1	347.0[2]	347.0	0.0
B	745	28	241	3.5	353.1	353.1	353.7	0.6
C	2,155	243	177	4.8	358.7	358.7	358.7	0.0
D	4,136	116	366	2.3	361.0	361.0	361.4	0.4
E	4,586	33	92	9.2	362.6	362.6	362.6	0.0
F	5,905	44	99	8.6	443.0	443.0	443.4	0.4
G	6,607	222	674	0.6	461.1	461.1	461.2	0.1
H	6,837	223	675	0.6	461.1	461.1	461.2	0.1

[1]Feet above confluence with Norwalk River

[2]Elevation computed without consideration of backwater effects from Norwalk River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

FLOODWAY DATA

RIDGEFIELD BROOK AND COOPER POND BROOK

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Cooper Pond Brook (continued)								
I	7,538[1]	22	63	6.1	471.7	471.7	472.1	0.4
J	8,497[1]	10	36	10.8	543.7	543.7	543.7	0.0
K	8,773[1]	90	170	1.9	552.1	552.1	552.9	0.8
L	9,273[1]	269	925	0.3	552.3	552.3	553.0	0.7
M	10,523[1]	211	1,831	0.2	557.7	557.7	558.4	0.7
N	12,403[1]	92	99	3.2	563.3	563.3	563.3	0.0
O	13,513[1]	84	92	3.4	583.7	583.7	583.7	0.0
East Branch Silvermine River								
A	1,773[2]	30	133	4.6	567.8	567.8	567.9	0.1
B	3,568[2]	72	90	3.8	573.5	573.5	574.0	0.5

[1]Feet above confluence with Norwalk River

[2]Feet above corporate limits

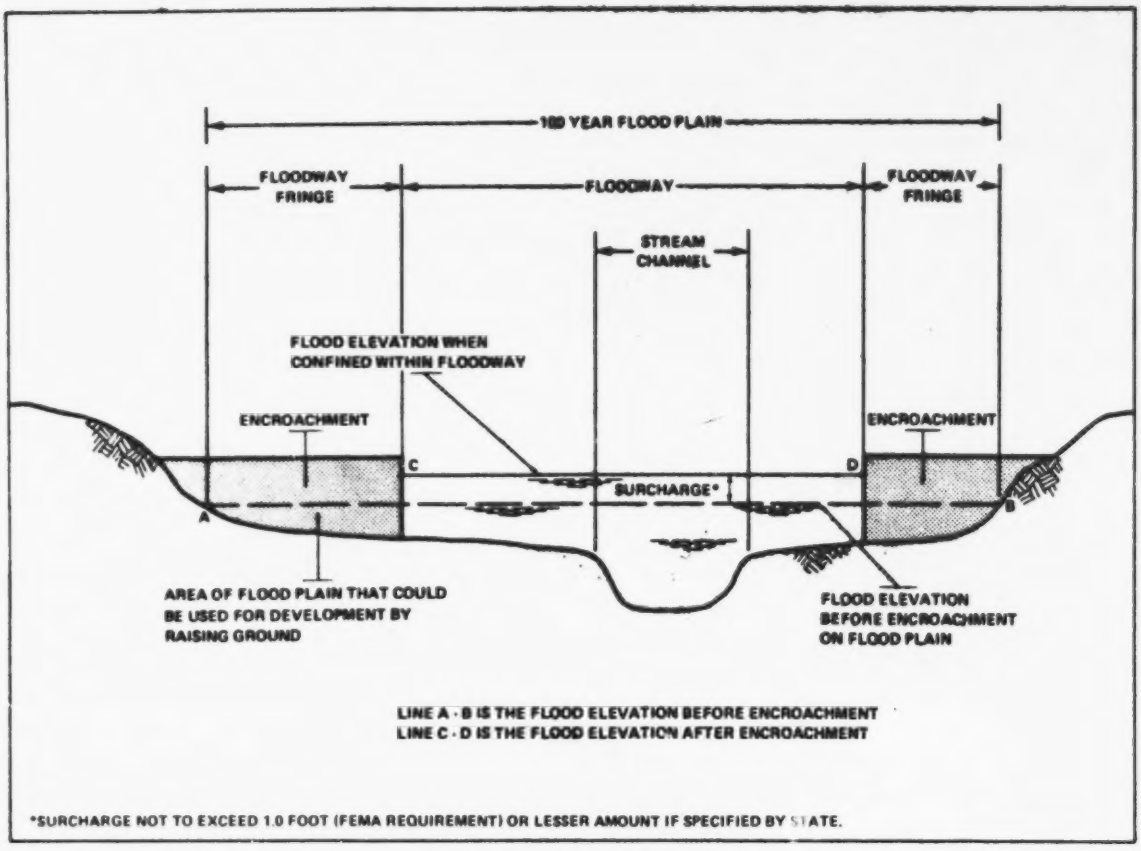
TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

FLOODWAY DATA

COOPER POND BROOK AND EAST BRANCH SILVERMINE RIVER


100 YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE A - B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C - D IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE.

FLOODWAY SCHEMATIC

Figure 9

Factors (FHFs), and flood insurance zone designations for each flooding source affecting the Town of Ridgefield.

5.1 Reach Determinations

Reaches are defined as lengths of watercourses having relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference does not have a variation greater than that indicated in the following table for more than 20 percent of the reach.

Average Difference Between 10- and 100-Year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot
7.1 to 12 feet	2.0 feet
More than 12 feet	3.0 feet

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The locations of the reaches determined for the flooding sources of the Town of Ridgefield are shown on the Flood Profiles (Exhibit 1) and are summarized in the Flood Insurance Zone Data Table (Table 3).

5.2 Flood Hazard Factors

The FHF is the FEMA device used to correlate flood information with insurance rate tables. Correlations between property damage from floods and their FHFs are used to set actuarial insurance premium rate tables based on FHFs from 005 to 200.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations expressed to the nearest 0.5 foot, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year water-surface elevations is greater than 10.0 feet, accuracy for the FHF is to the nearest foot.

5.3 Flood Insurance Zones

After the determination of reaches and their respective FHFs, the entire incorporated area of the Town of Ridgefield was divided into zones, each having a specific flood potential or hazard. Each zone was assigned one of the following flood insurance zone designations:

Zone A:	Special Flood Hazard Areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations shown or FHFs determined.
Zones A1, A2, A3, A4, and A5:	Special Flood Hazard Areas inundated by the 100-year flood, determined by detailed methods; base flood elevations shown, and zones subdivided according to FHF.
Zone B:	Areas between the Special Flood Hazard Area and the limits of the 500-year flood, including areas of the 500-year flood plain that are protected from the 100-year flood by dike, levee, or other water control structure; also, areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.
Zone C:	Areas of minimal flooding.

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FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FHF	ZONE	BASE FLOOD ELEVATION[3] (NGVD)
		10% (10 YR.)	2% (50 YR.)	0.2% (500 YR.)			
Norwalk River							
Reach 1	10	-2.5	-0.9	+2.1	025	A5	Varies
Reach 2	06,08						
	10	-2.1	-0.8	+1.6	020	A4	Varies
Titicus River							
Reach 1	02,03						
	05,06						
	07	-1.4	-0.7	+0.7	015	A3	Varies
Reach 2	07	-1.9	-0.8	+0.5	020	A4	Varies
Ridgefield Brook							
Reach 1	06,08	-0.7	-0.3	+0.8	005	A1	Varies
Cooper Pond Brook							
Reach 1	10	-2.2	-0.8	+1.0	020	A4	Varies
Reach 2	08,10	-0.9	-0.4	+0.4	010	A2	Varies

[1]Flood Insurance Rate Map Panel
[2]Weighted Average
[3]Rounded to the nearest foot - see map

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

FLOOD INSURANCE ZONE DATA

NORWALK RIVER, TITICUS RIVER, RIDGEFIELD BROOK AND COOPER POND BROOK

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FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FHF	ZONE	BASE FLOOD ELEVATION[3] (NGVD)
		10% (10 YR.)	2% (50 YR.)	0.2% (500 YR.)			
East Branch Silvermine River Reach 1	09	-1.5	-0.5	+0.6	015	A3	Varies

[1]Flood Insurance Rate Map Panel
[2]Weighted Average
[3]Rounded to the nearest foot - see map

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

FLOOD INSURANCE ZONE DATA

EAST BRANCH SILVERMINE RIVER

Table 3, "Flood Insurance Zone Data," summarizes the flood elevation differences, FHFs, flood insurance zones, and base flood elevations for the flooding sources studied in detail in the Town of Ridgefield.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the Town of Ridgefield is, for insurance purposes, the principal result of the Flood Insurance Study. This map (published separately) contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. This map is developed in accordance with the latest flood insurance map preparation guidelines published by the FEMA.

6.0 OTHER STUDIES

Flood Insurance Studies for the Towns of Wilton and Redding are currently being prepared (References 15 and 18). The results of those studies will be in exact agreement with the results of this study.

Profiles for the Norwalk River and Cooper Pond Brook in this study do not agree with the profiles determined for the streams in a previous SCS study or those found in the Report on Channel Encroachment Lines and Flood Plain Delineation, Norwalk River Watershed (References 6 and 11). The two previous studies assumed all projected flood control structures to be in place, while this study accounts for only those in place in the next five years. Discharges for the Titicus River in this study are in agreement with those presented in the Titicus River Flood Study (Reference 19).

Minor discrepancies exist between approximate flood boundaries in this study and the published Flood Insurance Study for the City of Danbury, Connecticut (Reference 20). These are due to improved topographic mapping used in this study. The Danbury study will be updated and the discrepancies resolved.

This study is authoritative for purposes of the Flood Insurance Program, and the data presented here either supersede or are compatible with previous determinations.

7.0 LOCATION OF DATA

Survey, hydrologic, hydraulic, and other pertinent data used in this study can be obtained by contacting the office of the Insurance and Mitigation Division of the Federal Emergency Management Agency, Regional Director, Region I Office, J. W. McCormack Post Office and Courthouse Building, Room 462, Boston, Massachusetts 02109.

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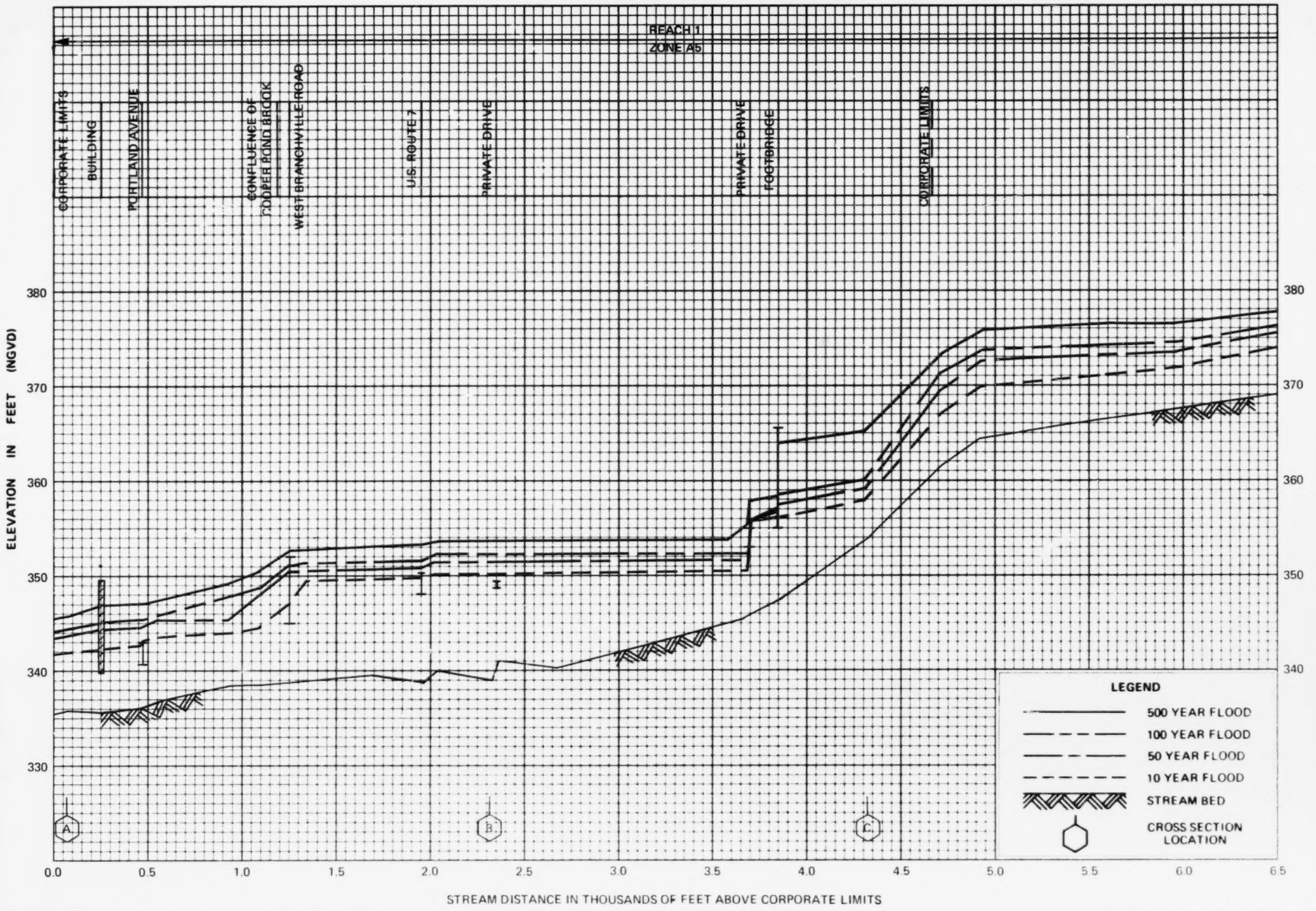

FLOOD PROFILES

NORWALK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

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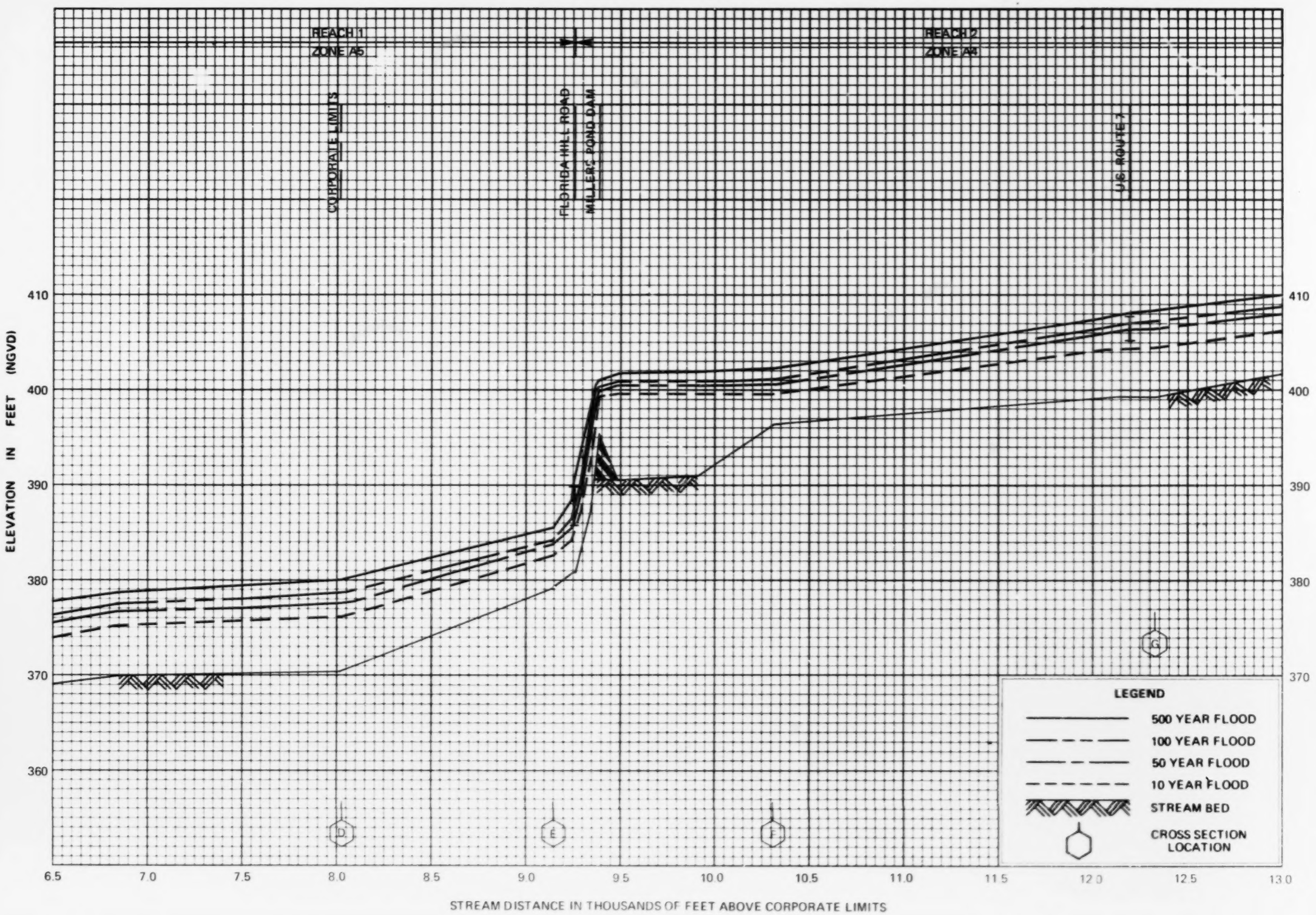

FLOOD PROFILES

NORWALK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

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REACH 2
ZONE A4

TOPSTONE ROAD
U.S. ROUTE 7
DAM
U.S. ROUTE 7
U.S. ROUTE 7

ELEVATION IN FEET (NGVD)

450
440
430
420
410
400

13.0 13.5 14.0 14.5 15.0 15.5 16.0 16.5 17.0 17.5 18.0 18.5 19.0 19.5

STREAM DISTANCE IN THOUSANDS OF FEET ABOVE CORPORATE LIMITS

LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
CROSS SECTION LOCATION

H
I

FLOOD PROFILES

NORWALK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

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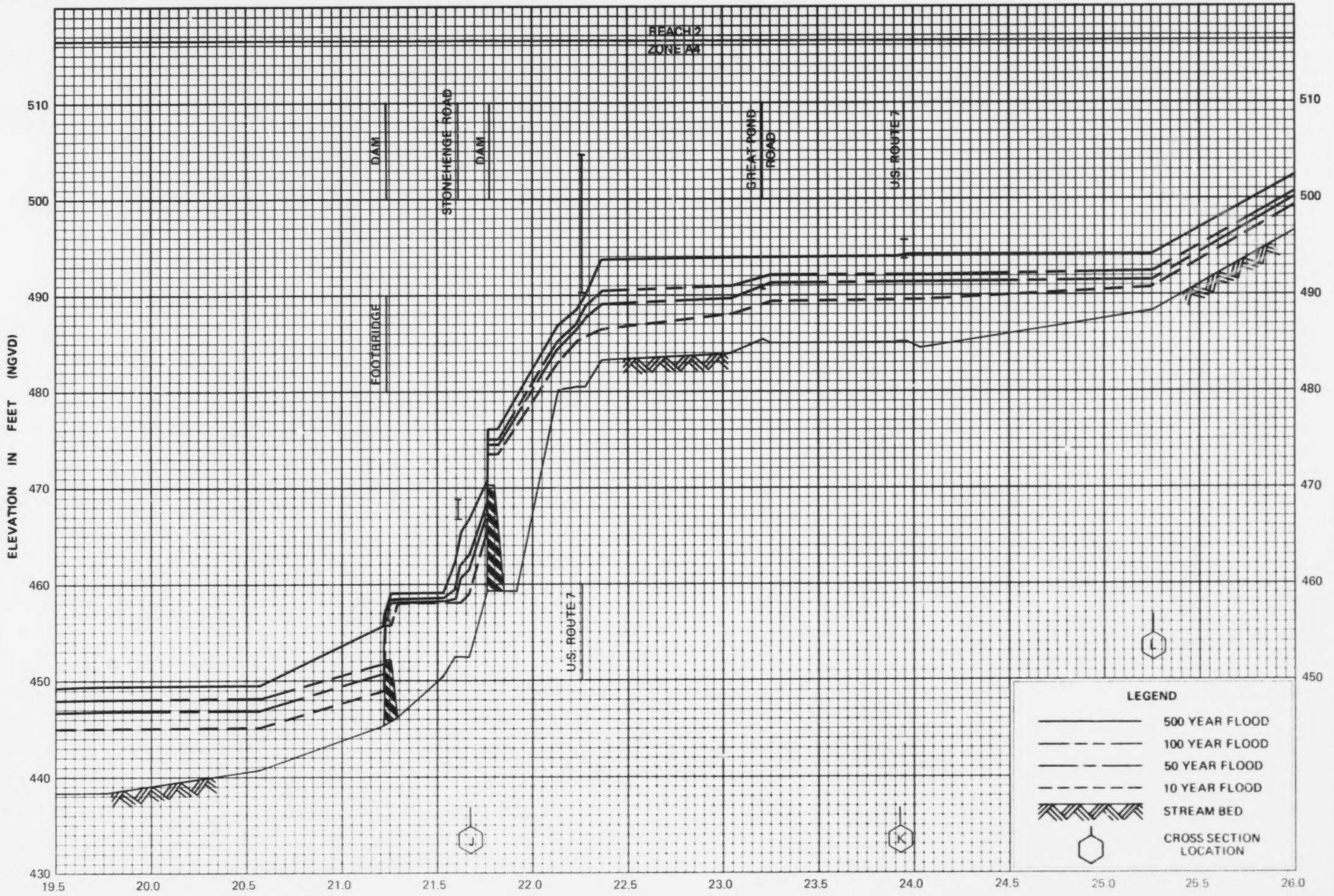

FLOOD PROFILES

NORWALK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

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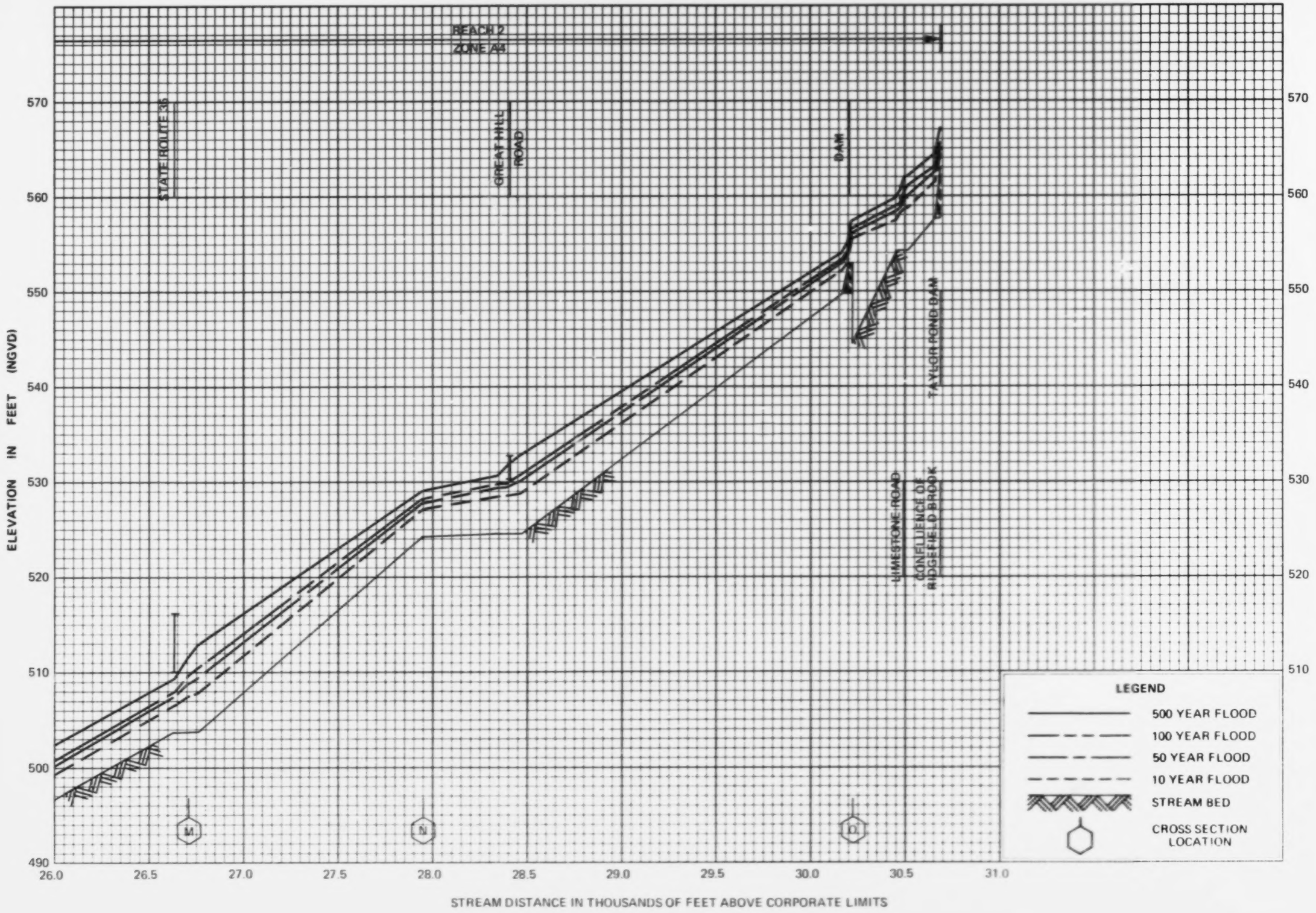

FLOOD PROFILES

NORWALK RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

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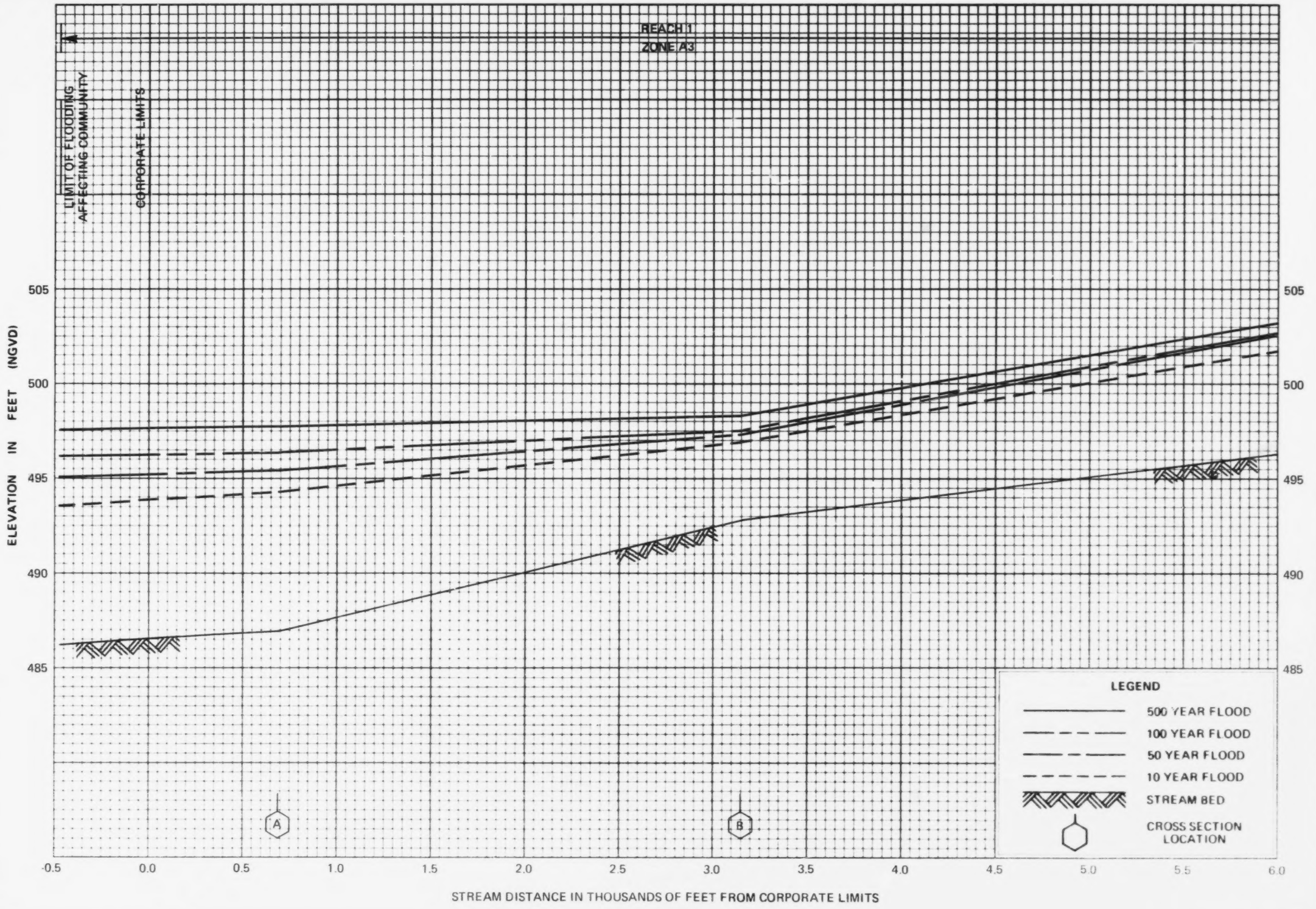

FLOOD PROFILES

TITICUS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

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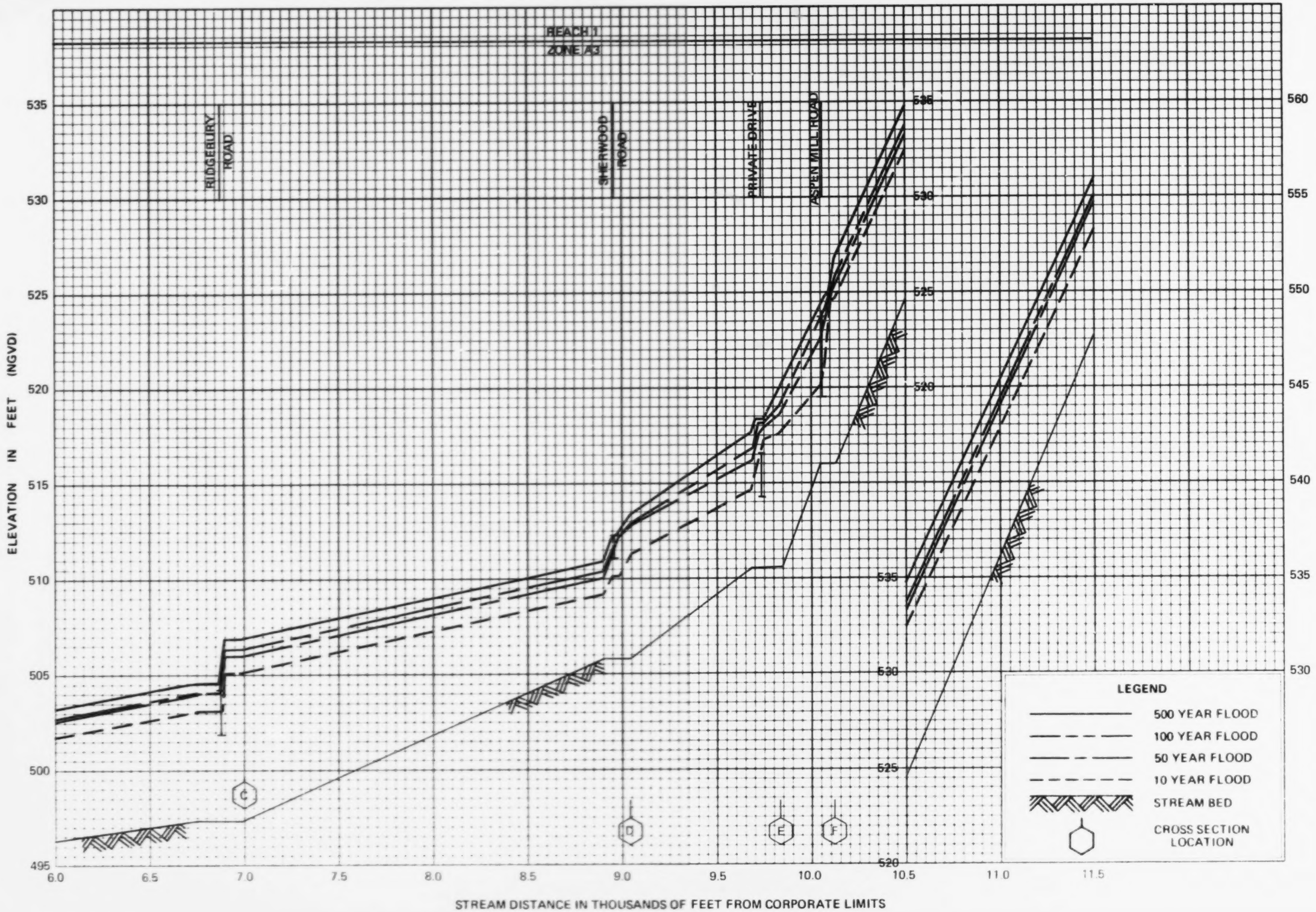

FLOOD PROFILES

TITICUS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

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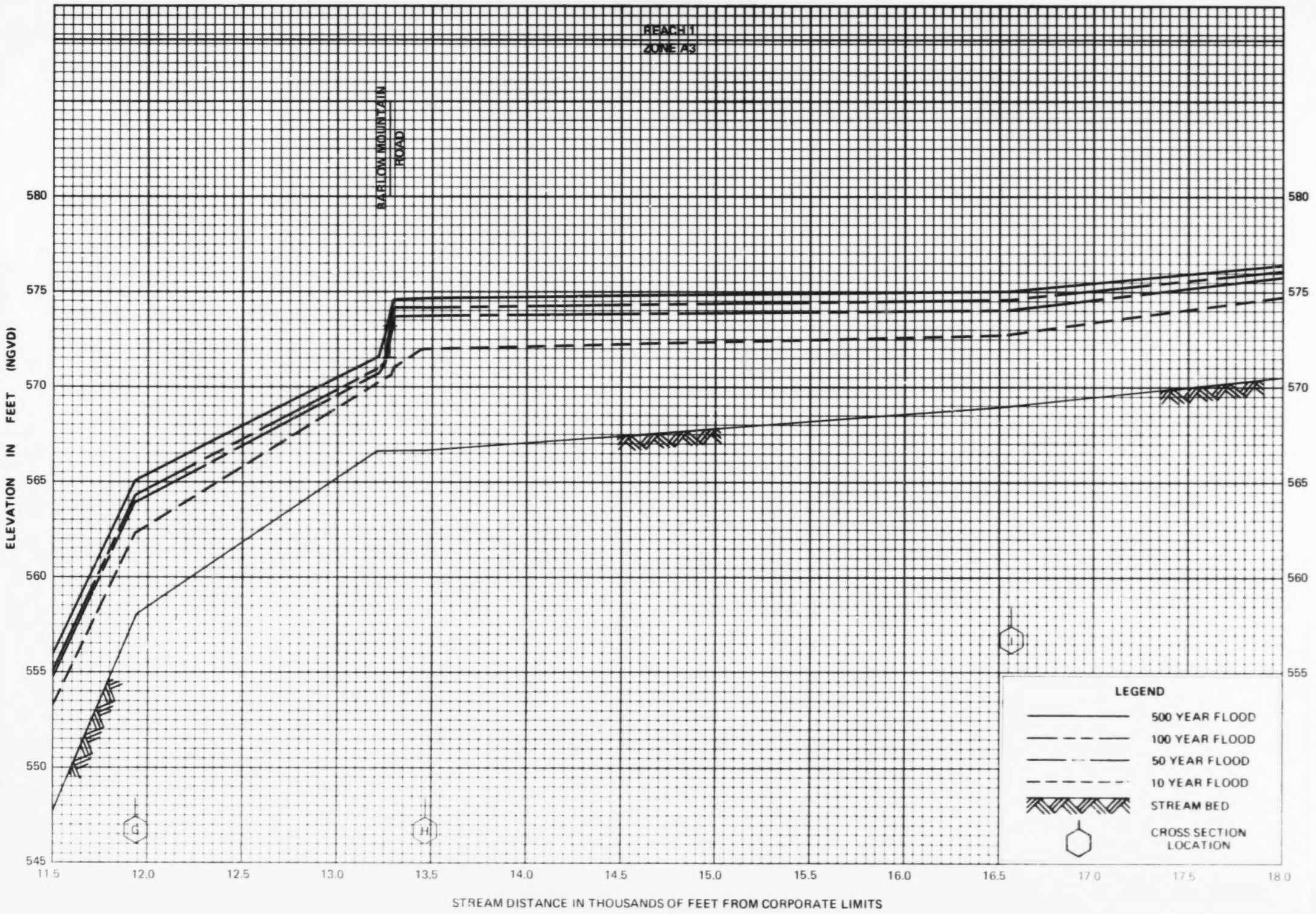

FLOOD PROFILES

TITICUS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

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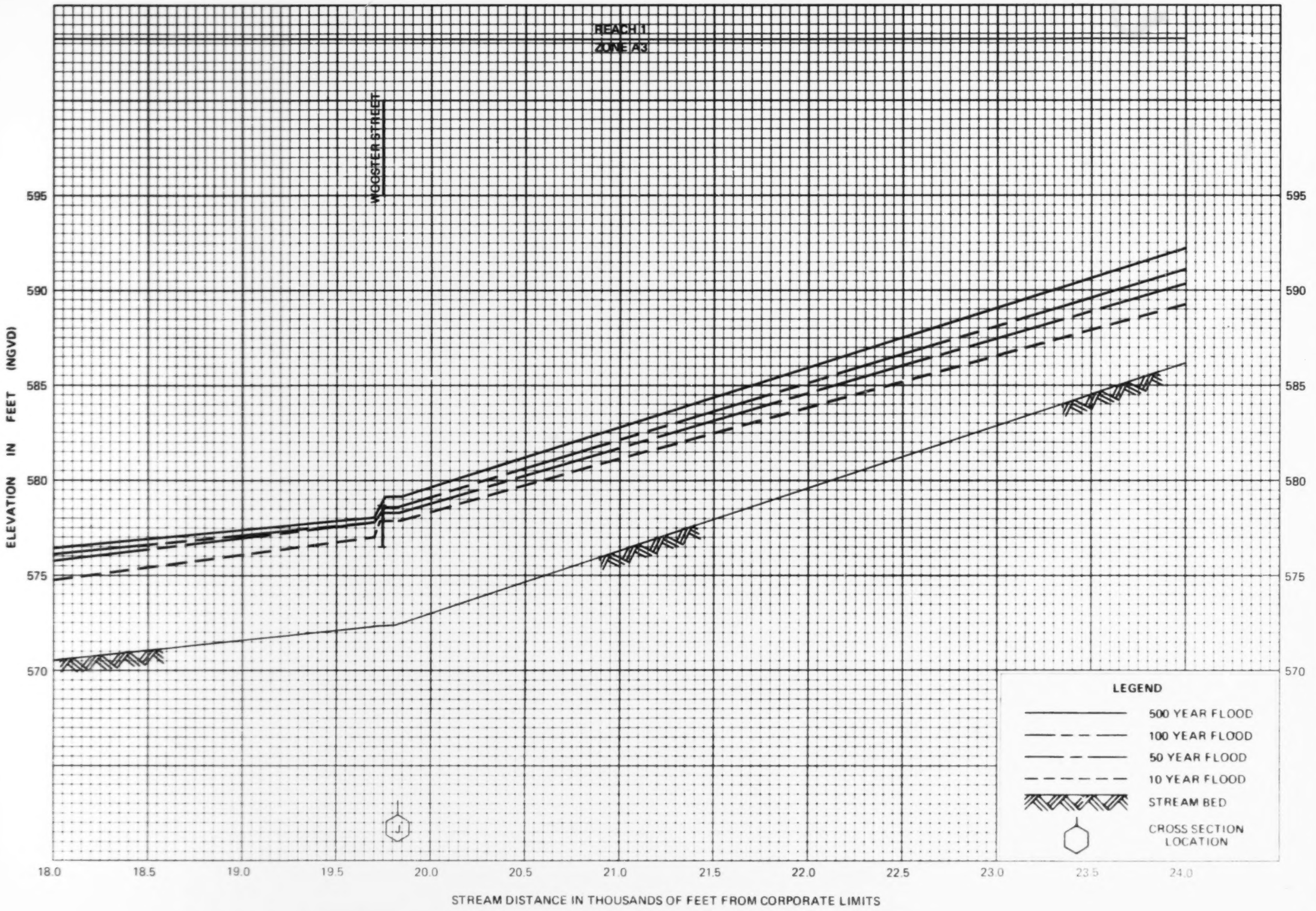

FLOOD PROFILES

TITICUS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

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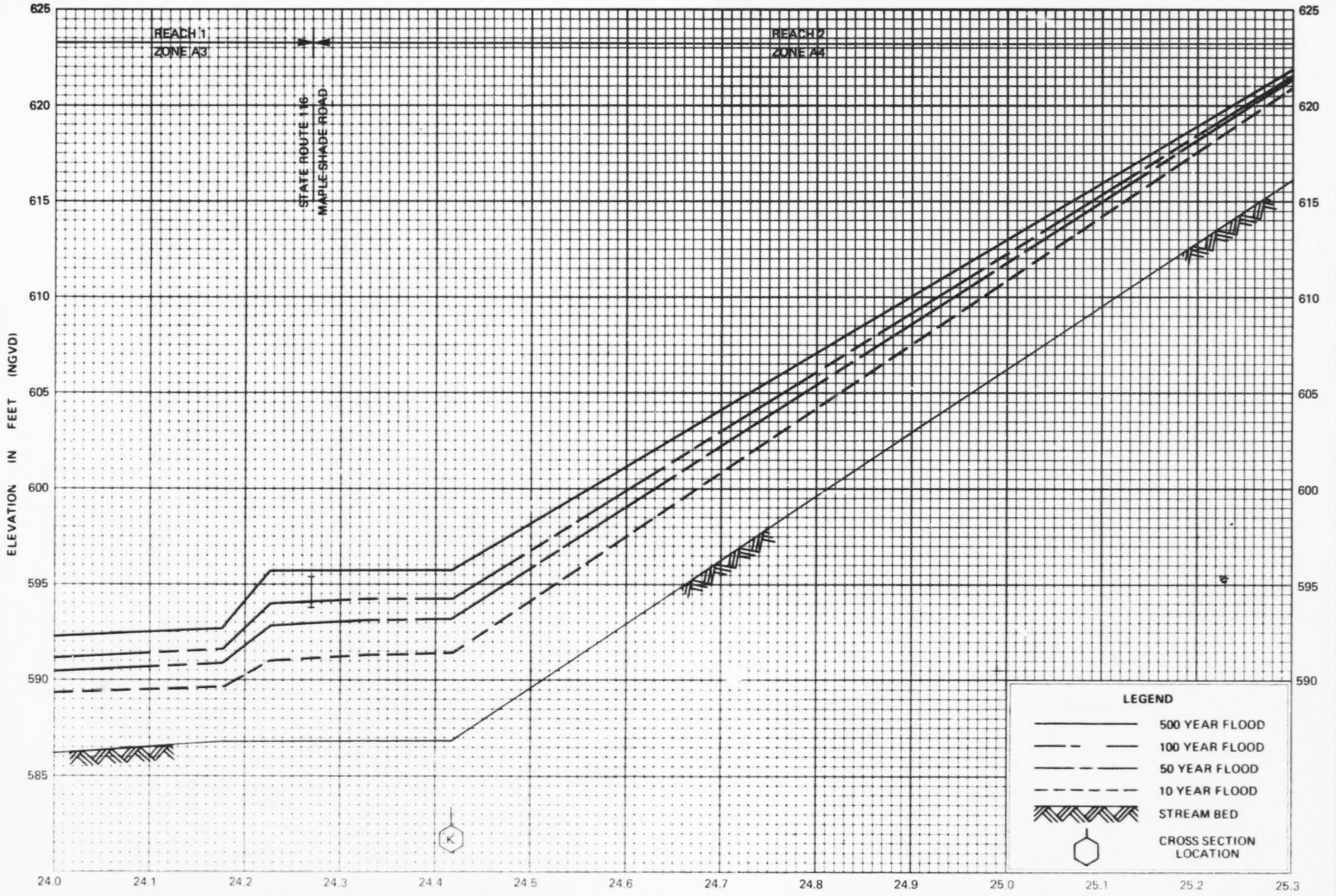

FLOOD PROFILES

TITICUS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

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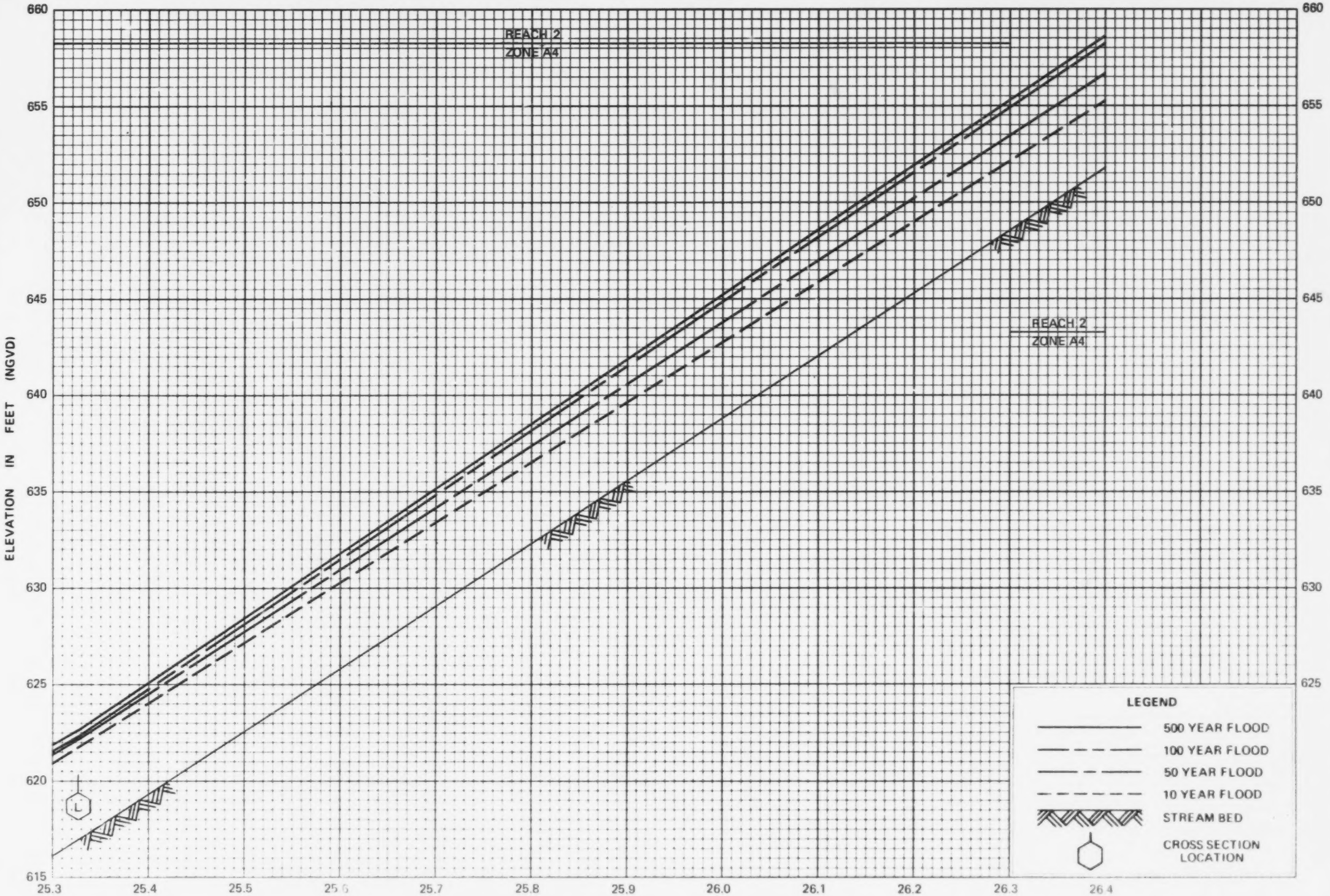

FLOOD PROFILES

TITICUS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

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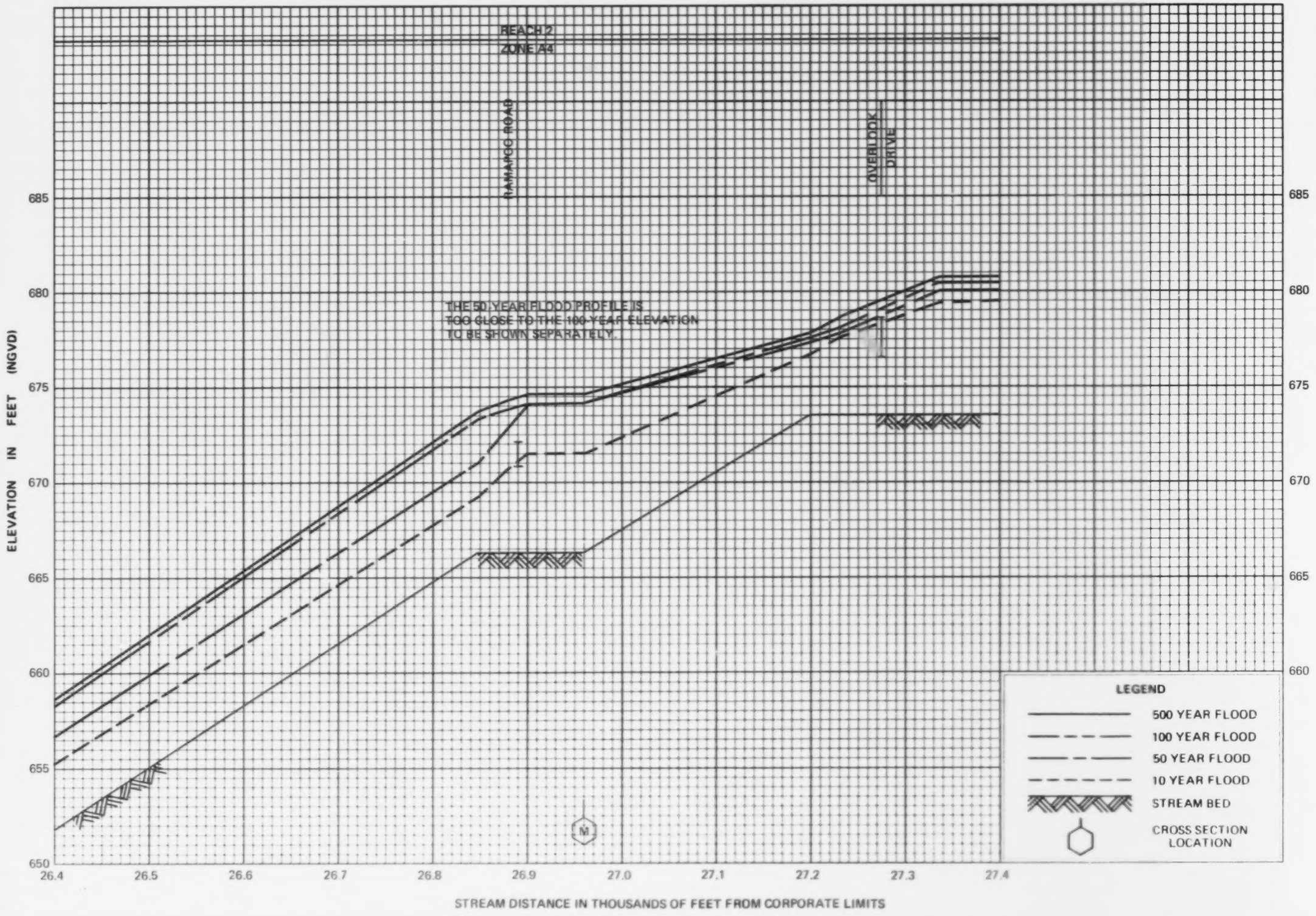

FLOOD PROFILES

TITICUS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

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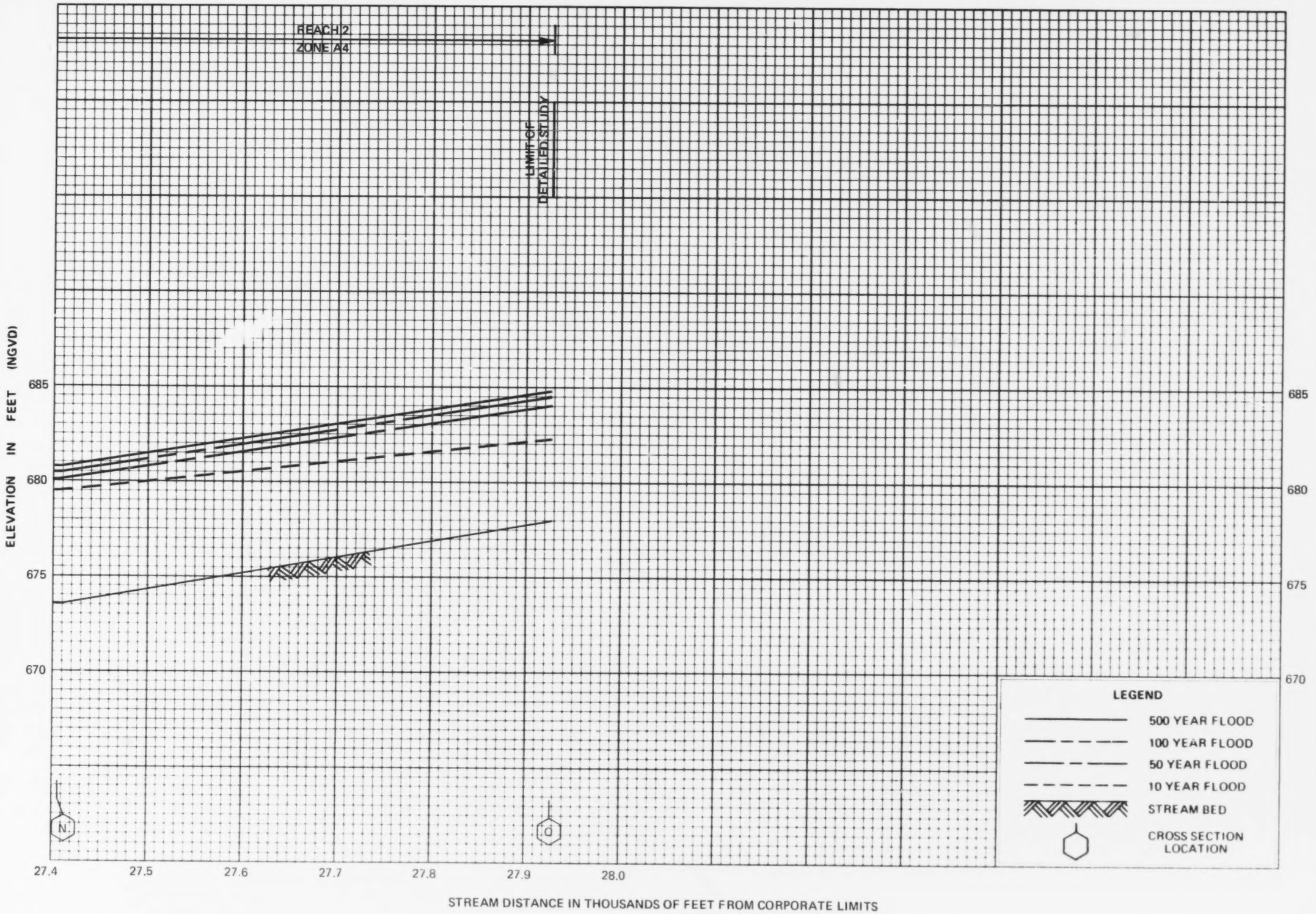

FLOOD PROFILES

TITICUS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

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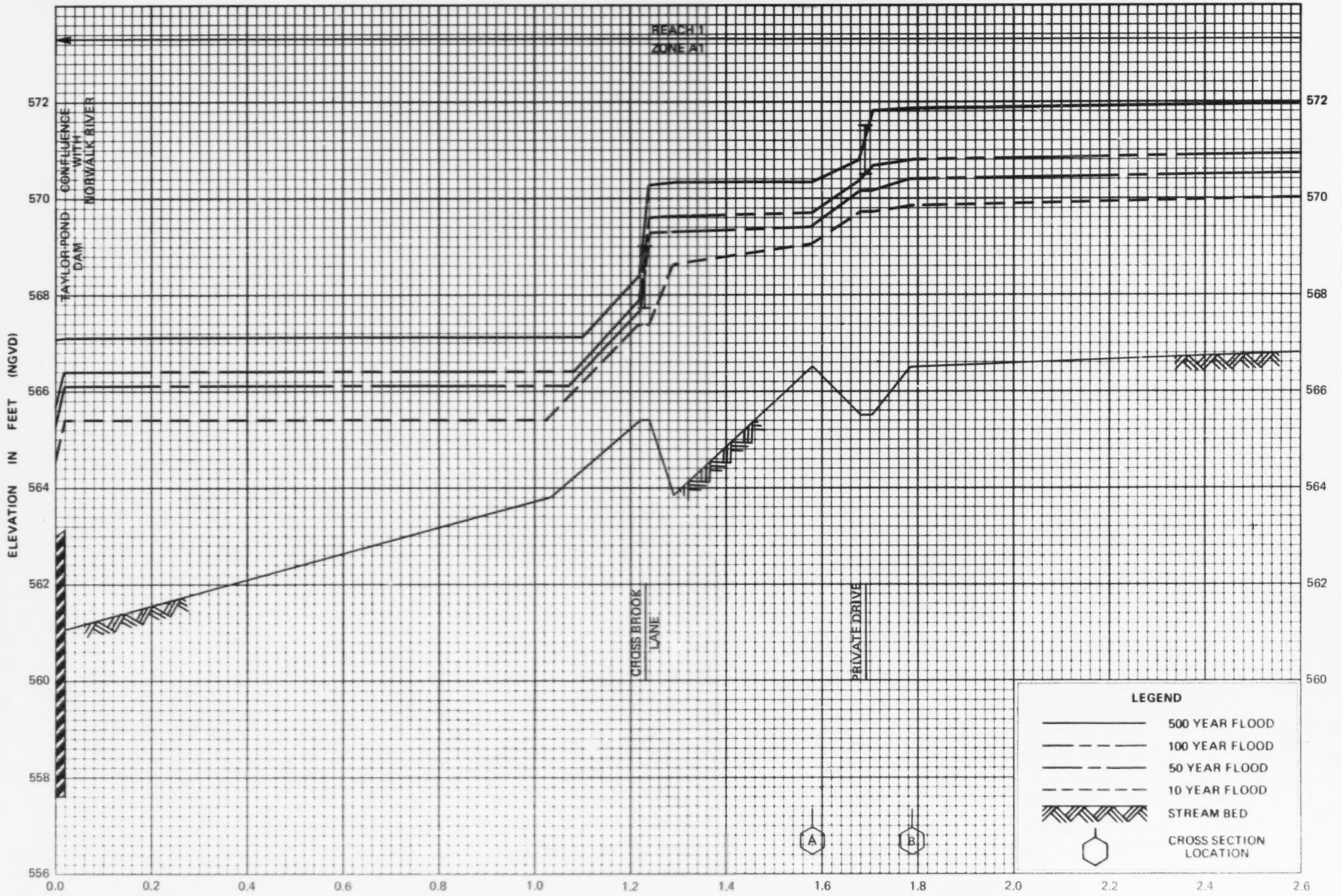

FLOOD PROFILES

RIDGEFIELD BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

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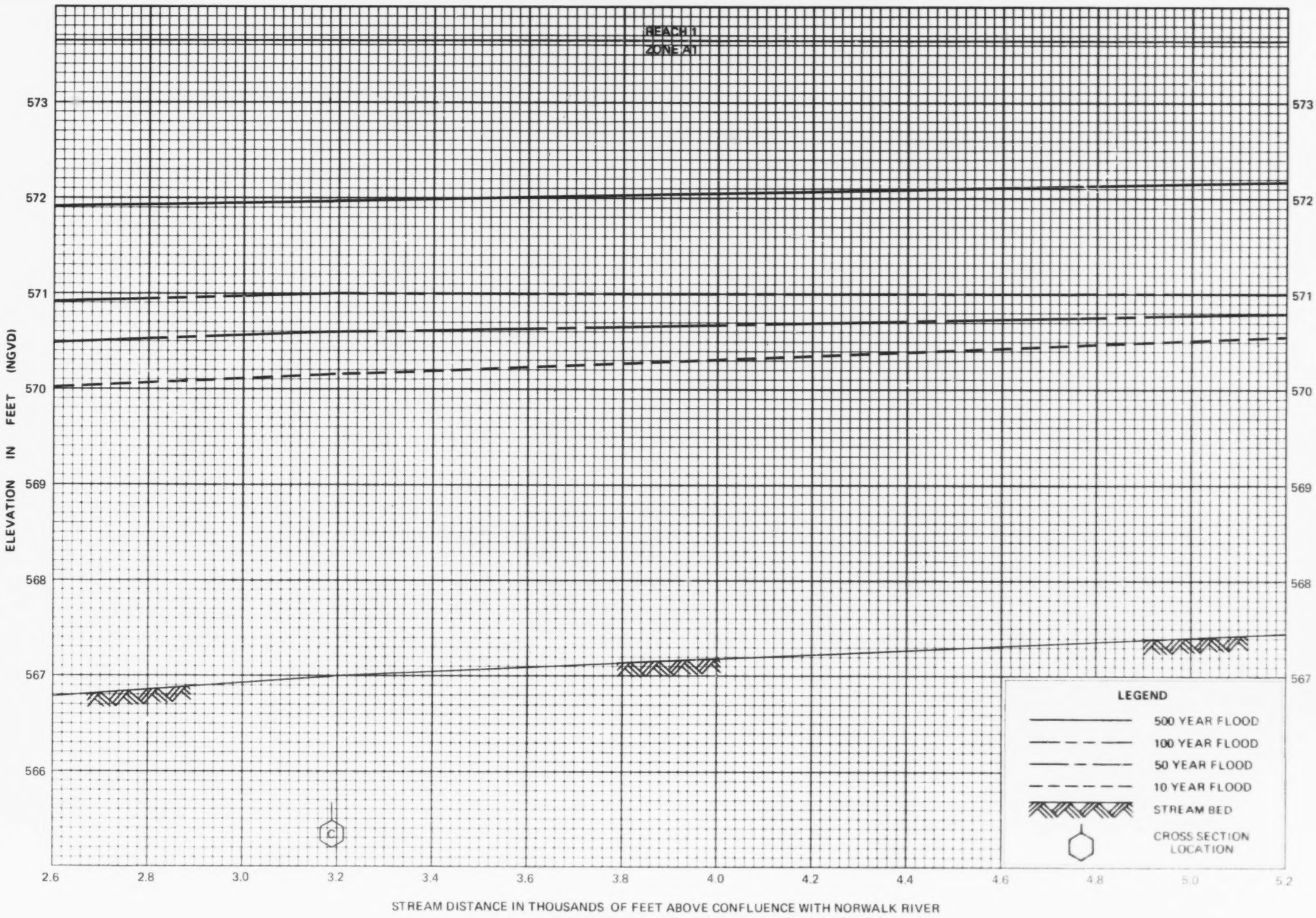

FLOOD PROFILES

RIDGEFIELD BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

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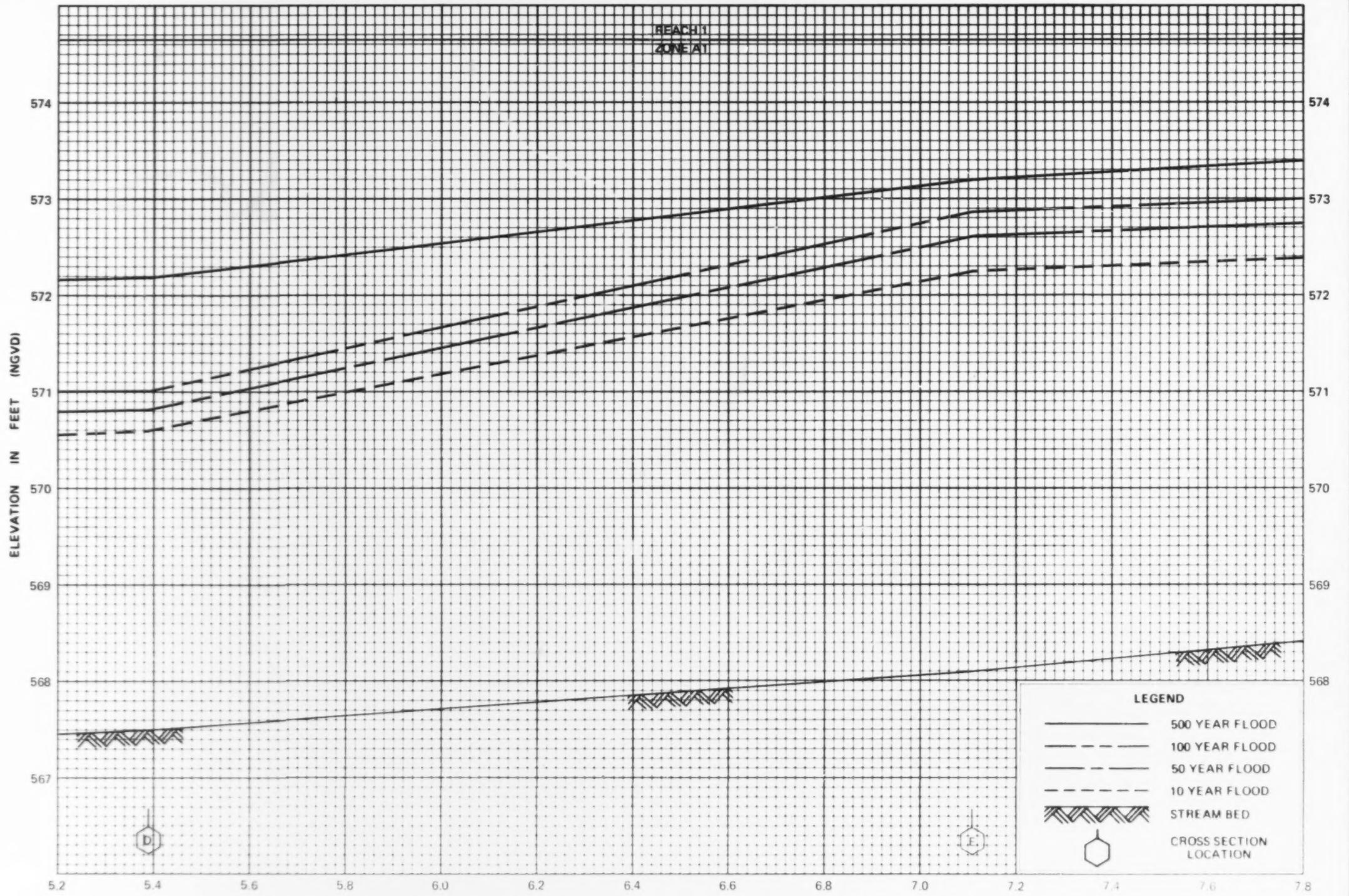

FLOOD PROFILES

RIDGEFIELD BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

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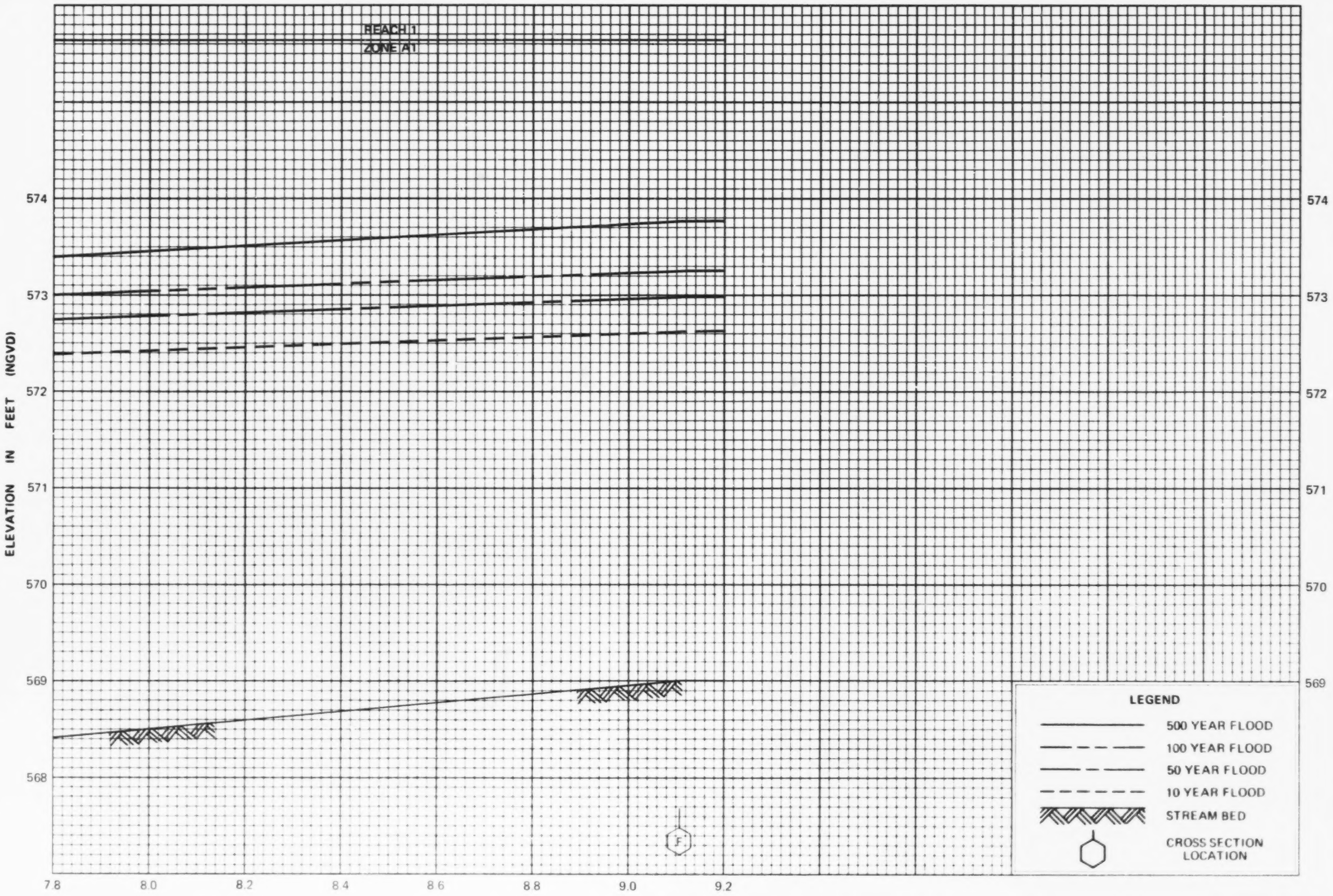

FLOOD PROFILES

RIDGEFIELD BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

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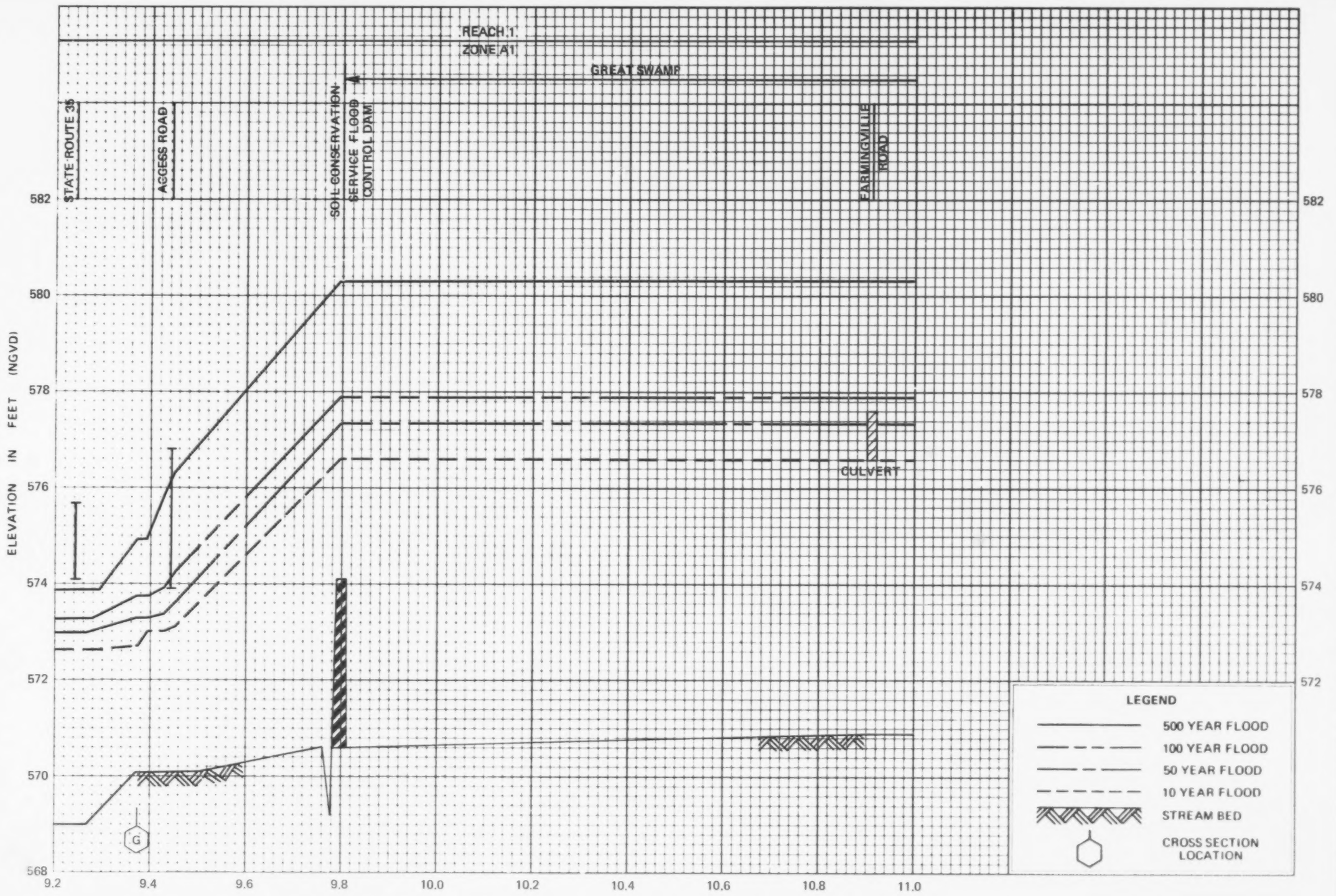

FLOOD PROFILES

RIDGEFIELD BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

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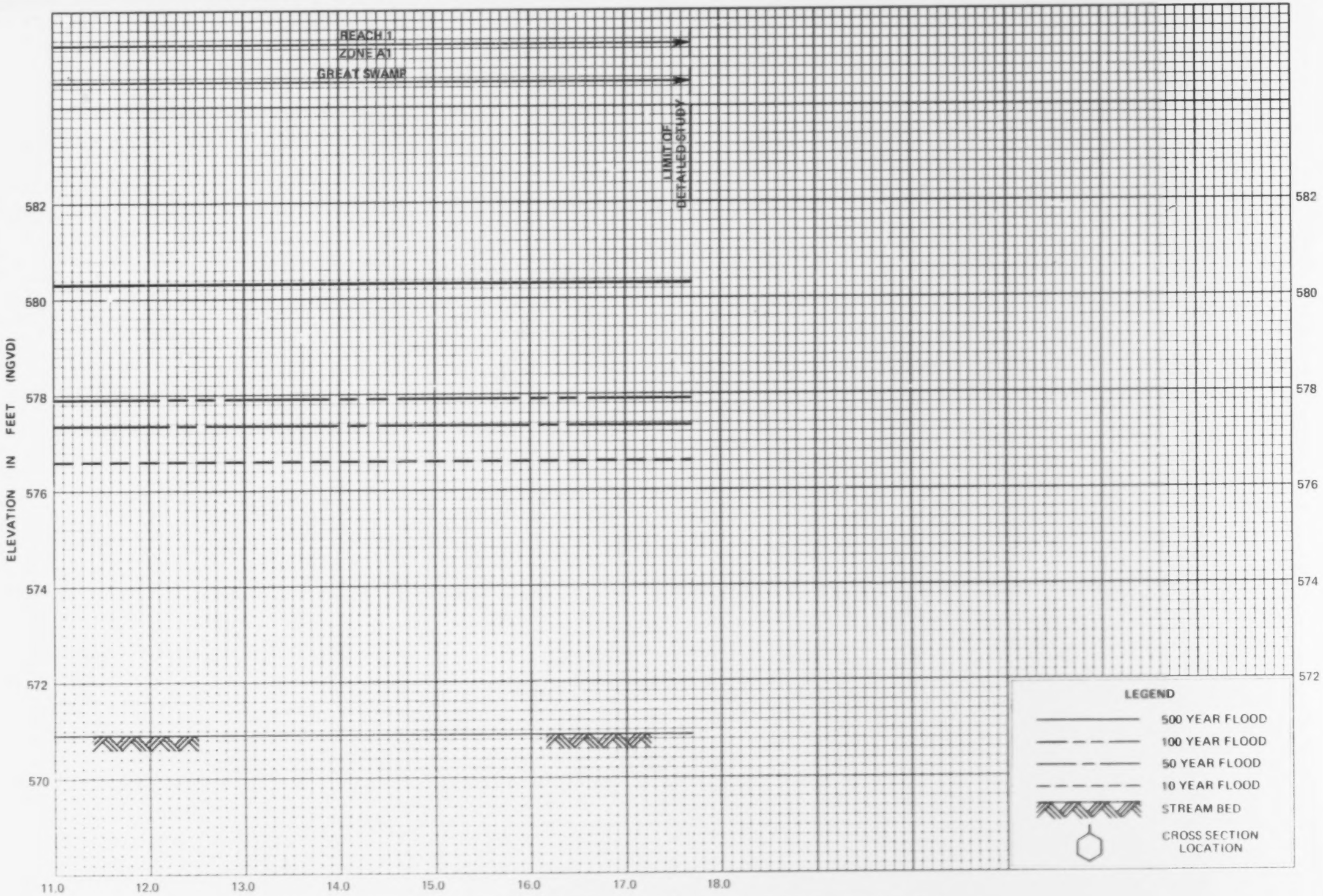

FLOOD PROFILES

RIDGEFIELD BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

19P

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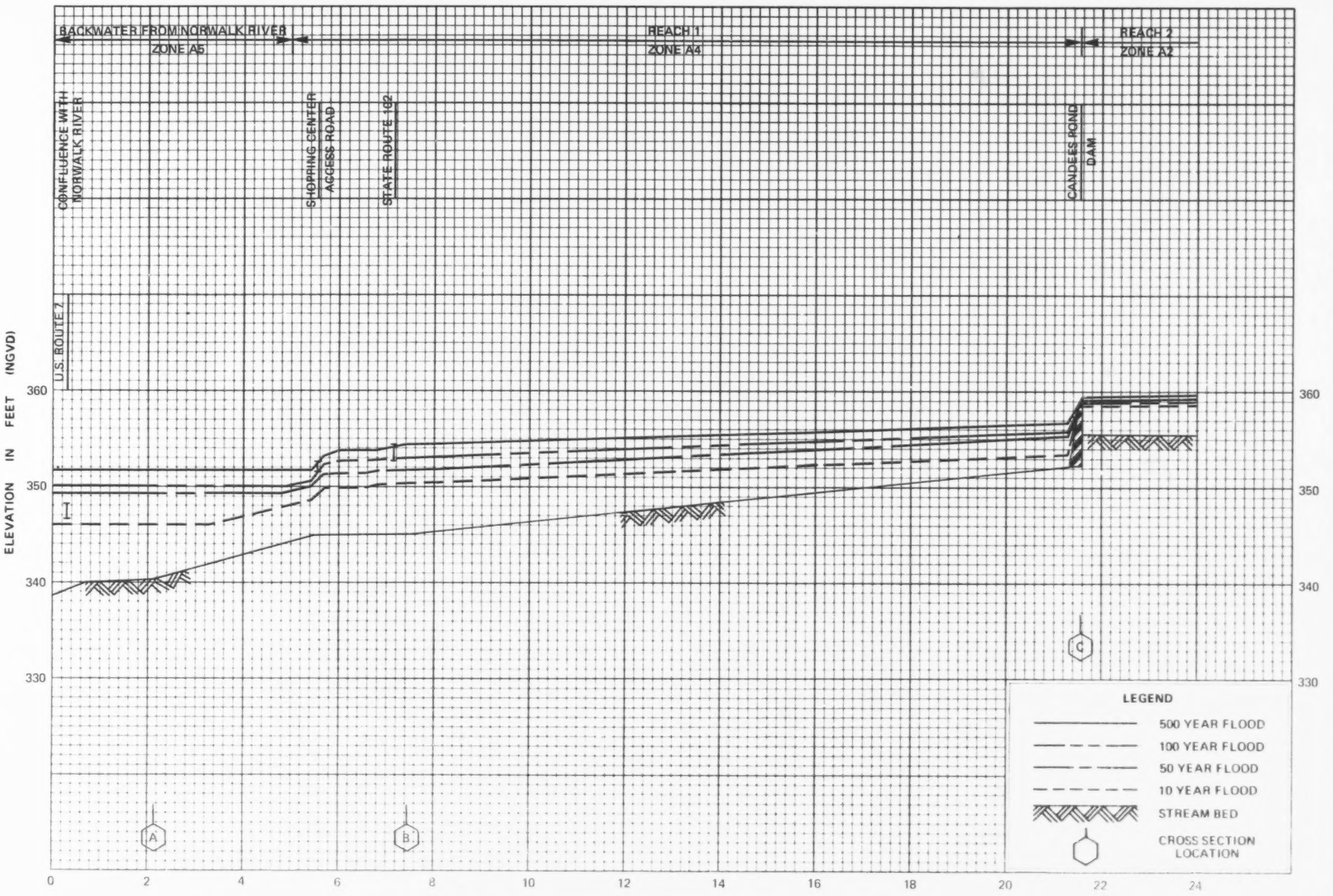

FLOOD PROFILES

COOPER POND BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

20P

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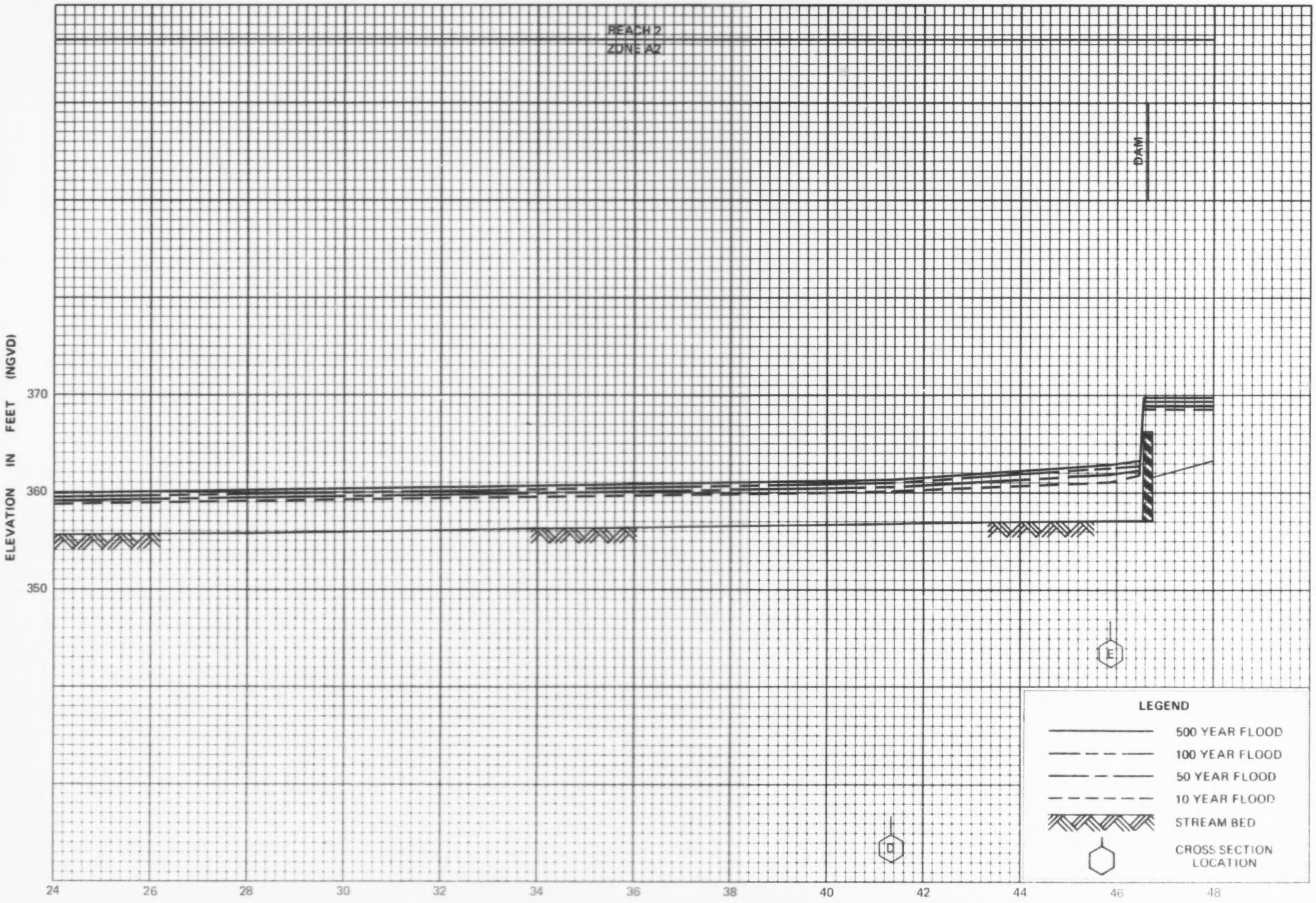

FLOOD PROFILES

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FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
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21P

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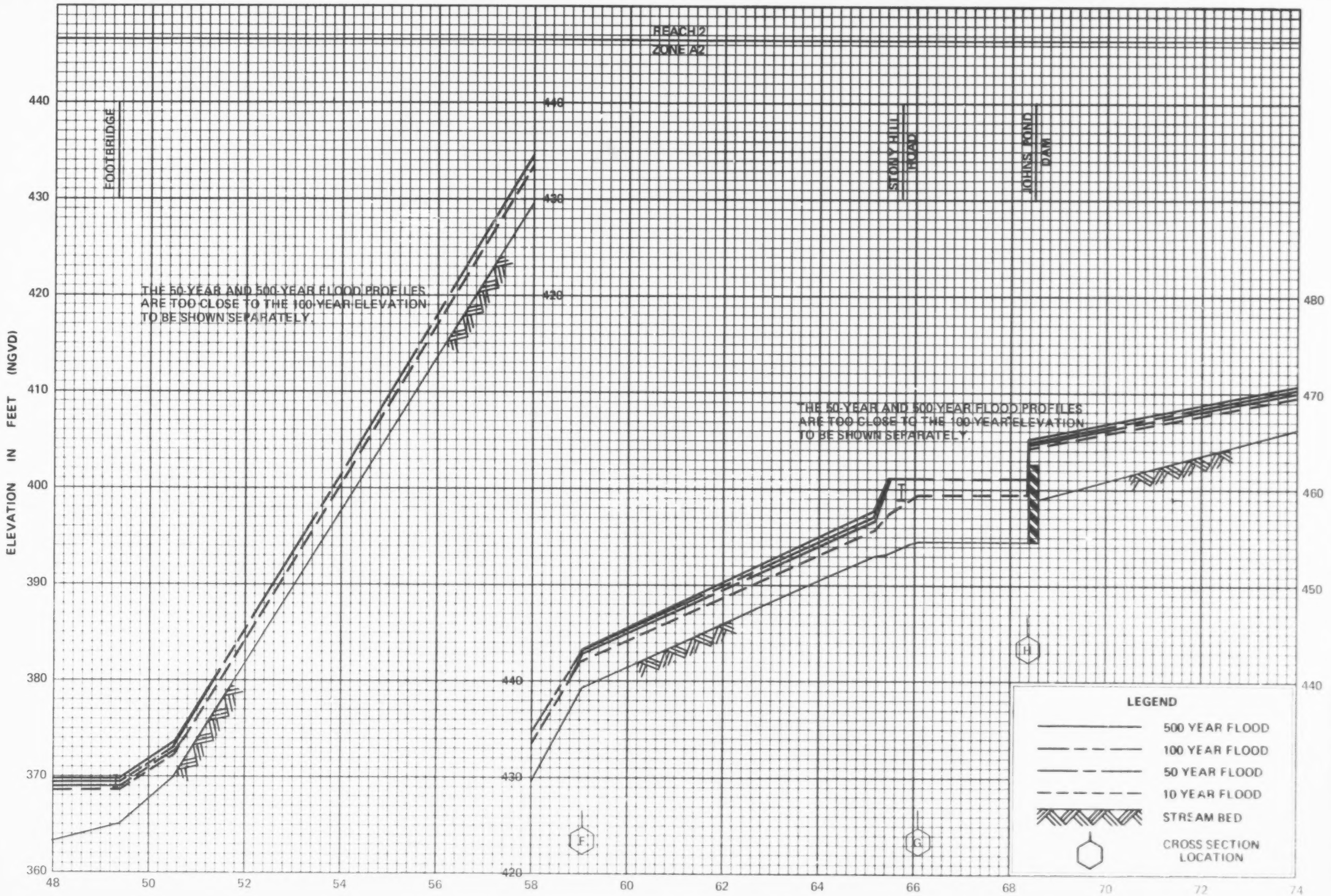

FLOOD PROFILES

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TOWN OF RIDGEFIELD, CT
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22P

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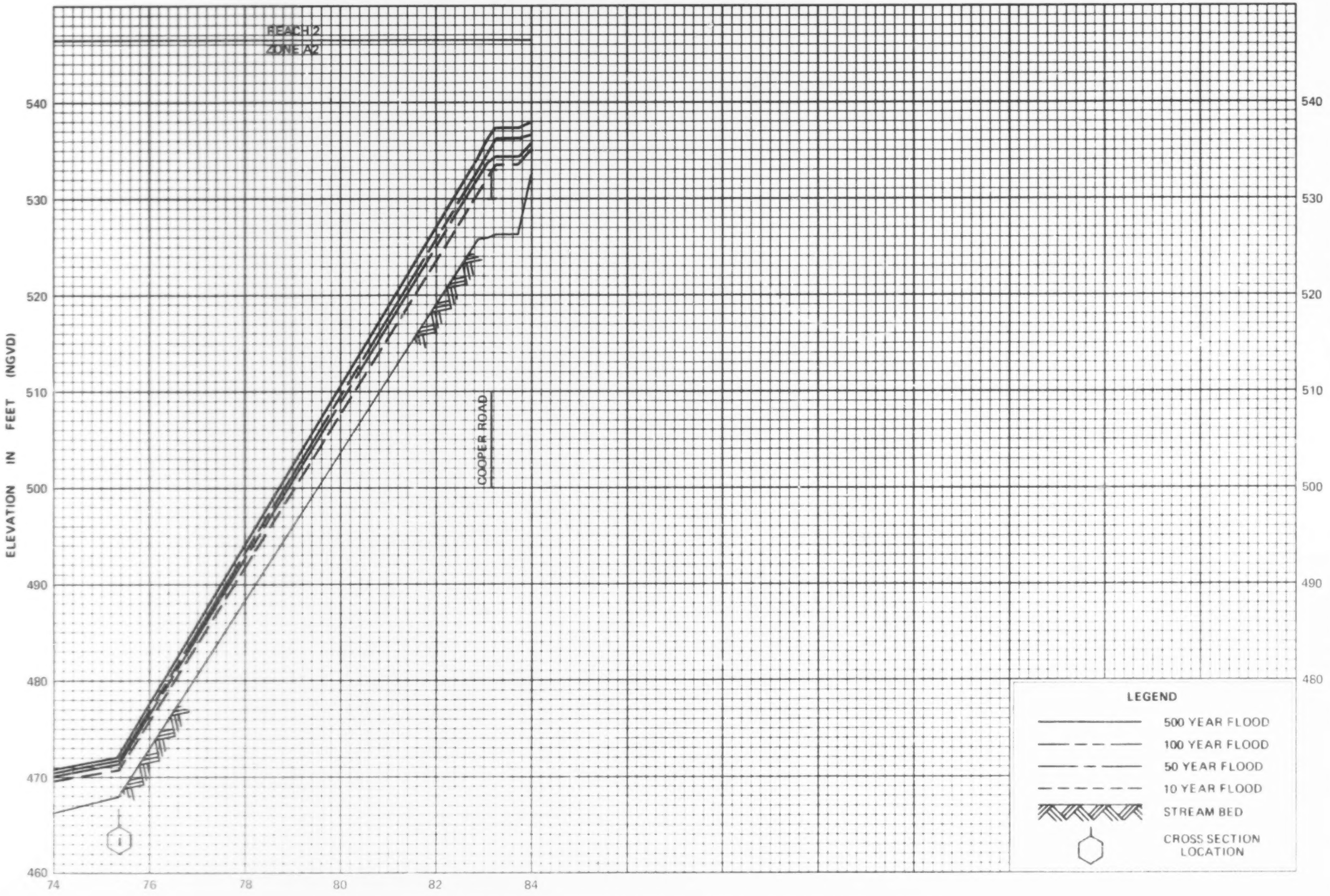

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FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

23P

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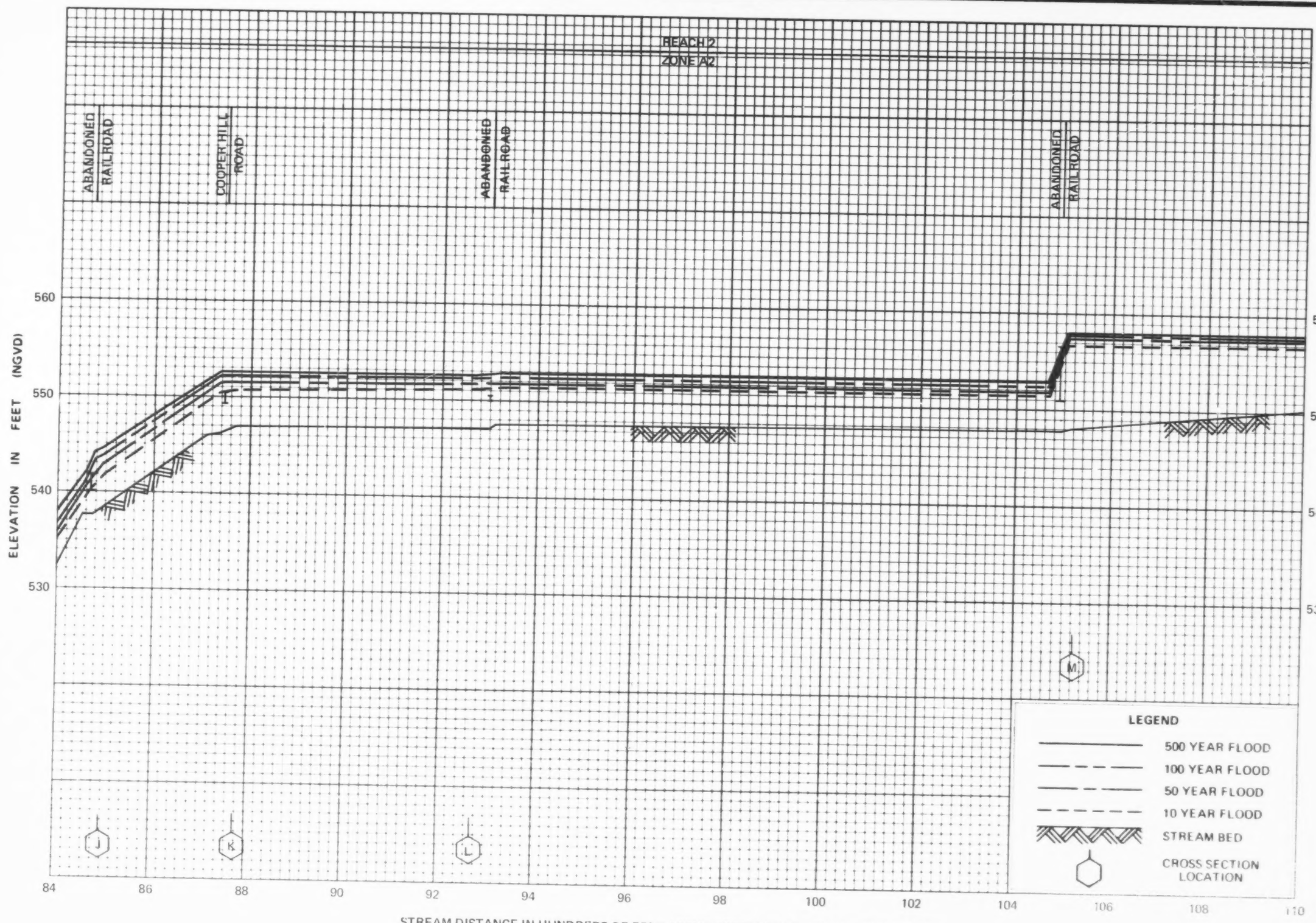

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FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

24P

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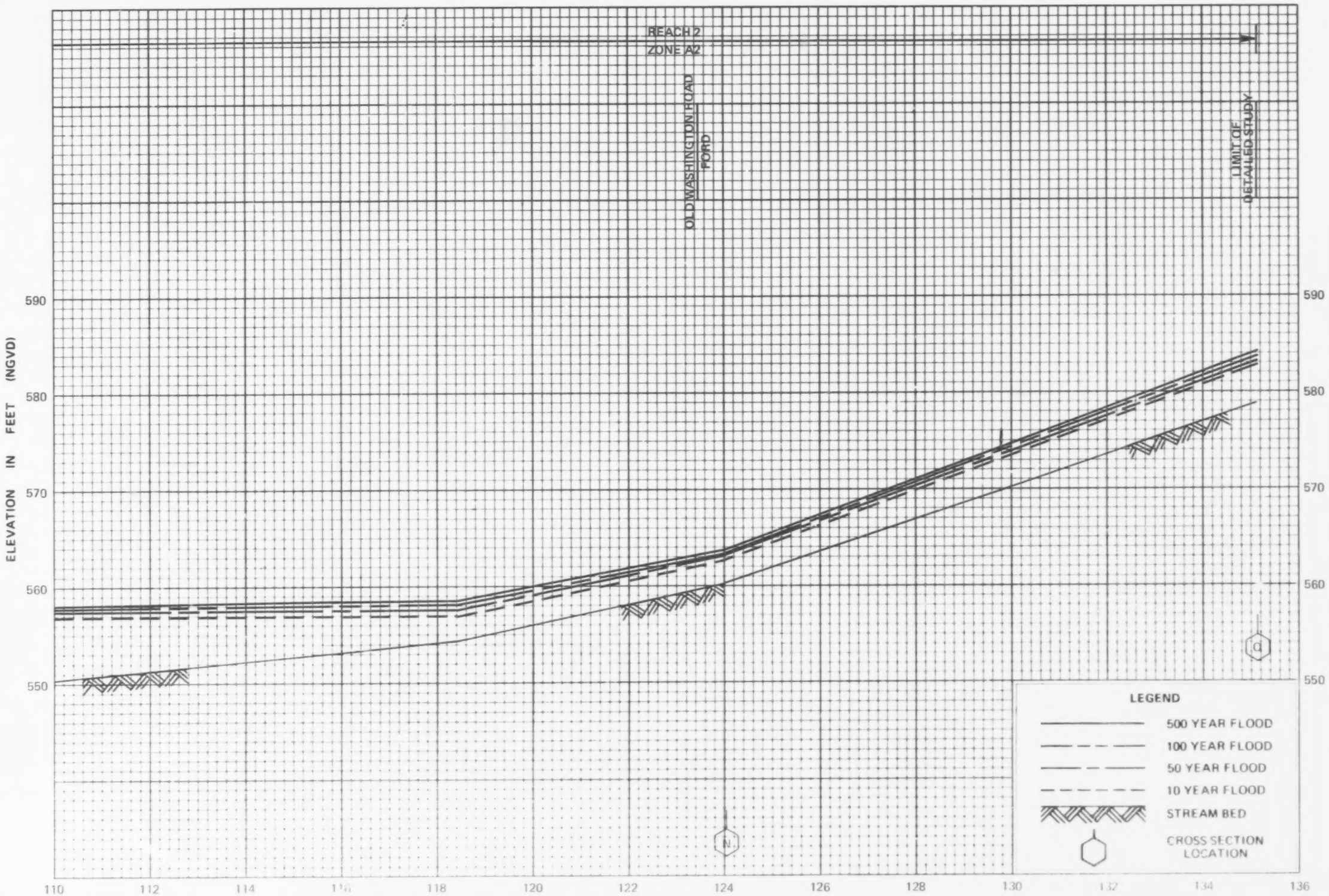

FLOOD PROFILES

COOPER POND BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

25P

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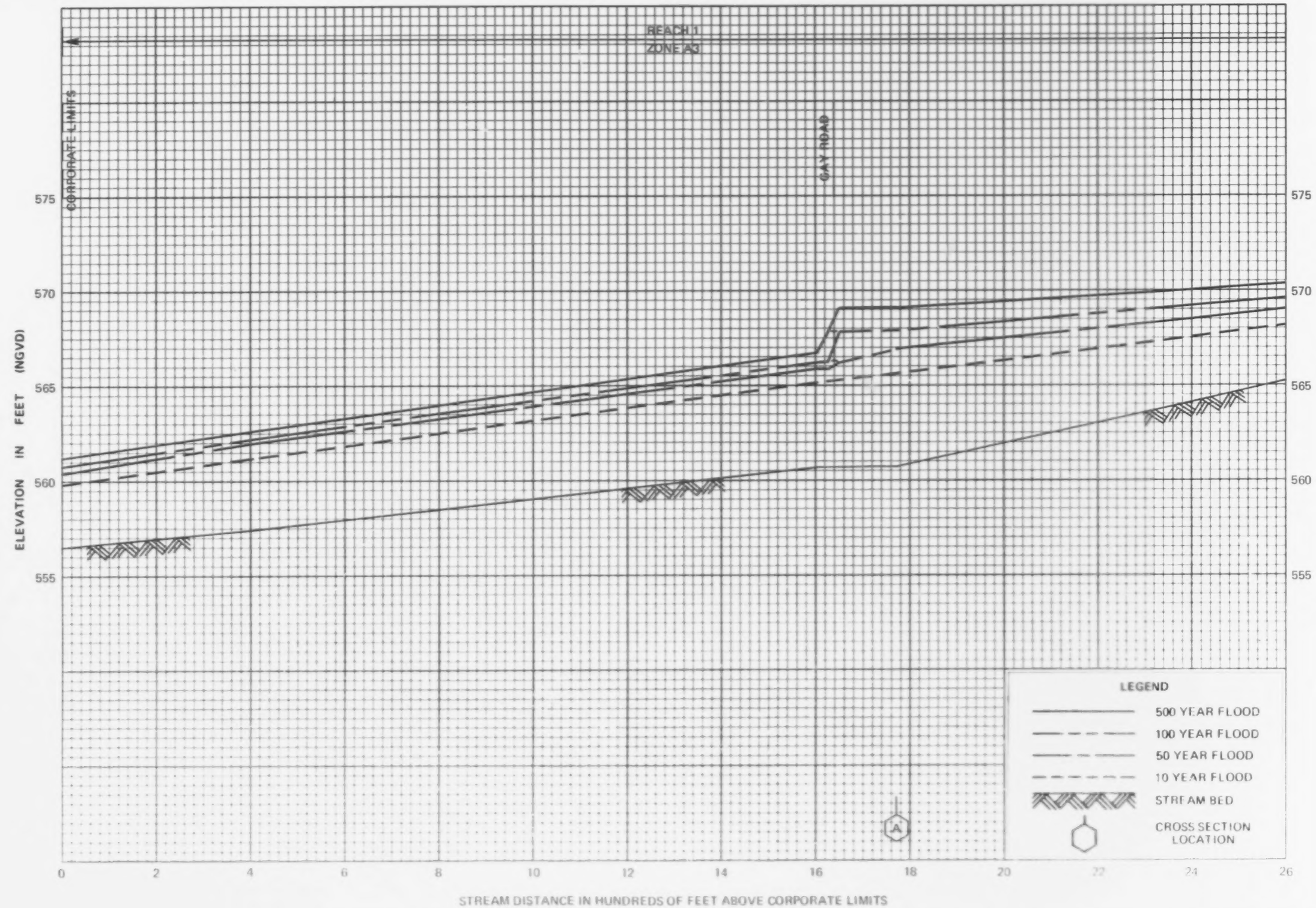

FLOOD PROFILES

EAST BRANCH SILVERMINE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

26P

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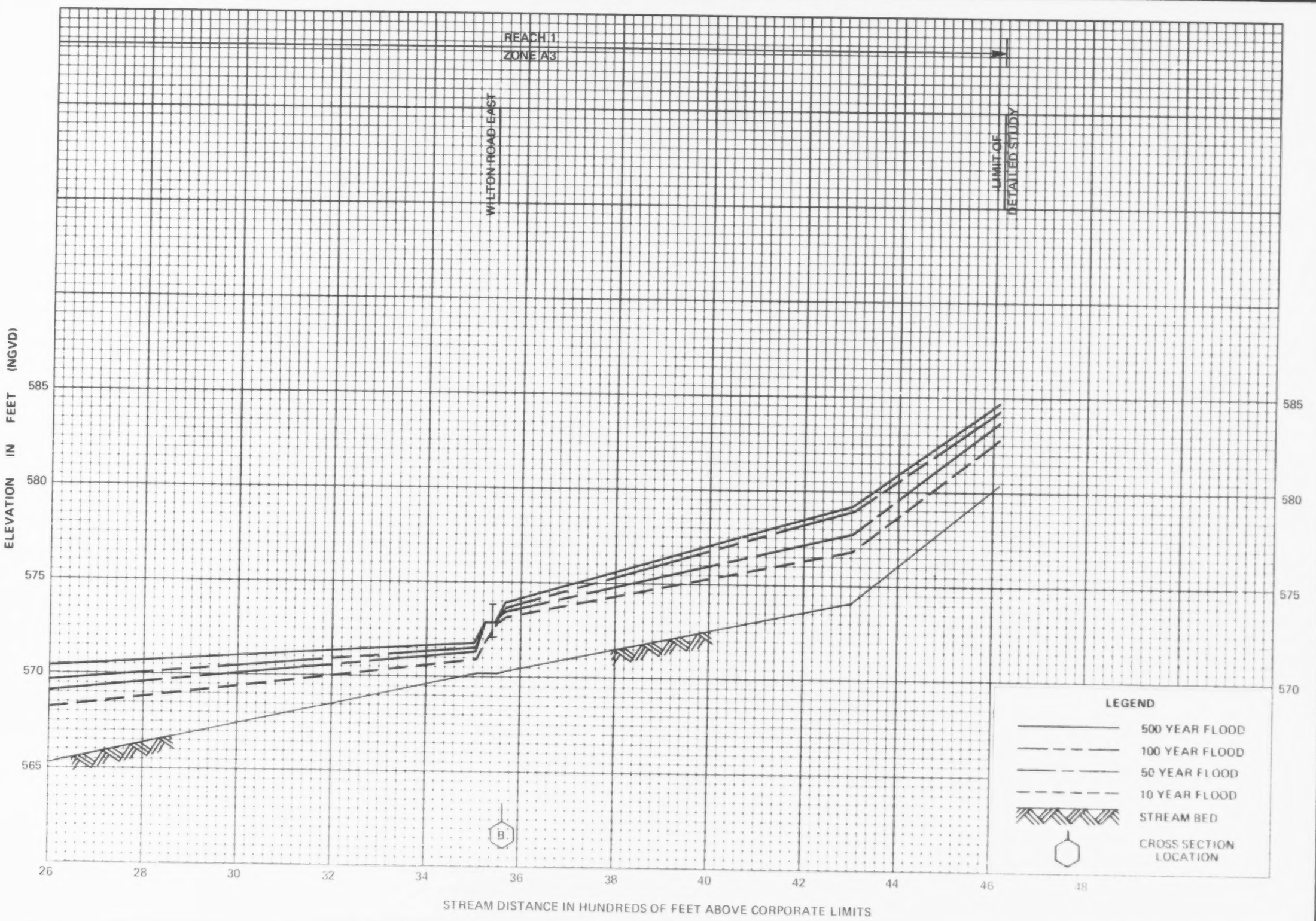

FLOOD PROFILES

EAST BRANCH SILVERMINE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF RIDGEFIELD, CT
(FAIRFIELD CO.)

27P